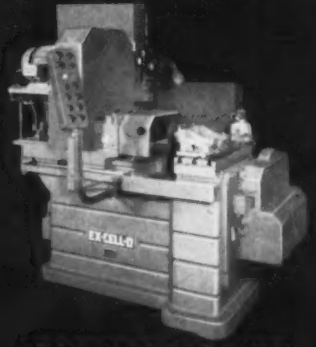
The IRON AGE

June 11, 1959 A Chilton Publication The National Metalworking Weekly

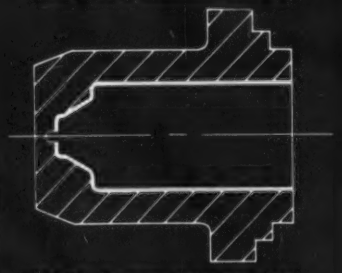
Acme Mfg. Co.'s Carlson and Hackert—

It Pays To Polish First, Form Later P. 129

LEFT—Closeup photo shows the .003" radius boring tools and the size of the parts held in the three-jawed diaphragm chucks.



ABOVE—The Style 308 Cam-Operated Precision Boring Machine used in this high-output machining operation.



ABOVE—Cutaway, twice actual size of the part, shows contour of the finished cut. Surface finish is held to 12 RMS.

BORES AND CONTOURS 184 PARTS PER HOUR

59-20

Style 308 Cam-Operated Precision Boring Machine finishes small stainless steel parts to 12 RMS

Speed and precision in continuous, close-tolerance production of contoured parts come easy to this Ex-Cell-O Cam-Operated Precision Boring Machine. Direct cam action makes it possible. Two cams are mounted on a single shaft; one acts directly on the cross slide follower, the other on the table follower. There are no levers. Changing the cams changes the form for the next job—in minutes.

Style 308 (illustrated) and the larger Style 312 hold the parts in one or more spindles, tools are mounted on the cross slide. The machine above uses such a setup to straight-bore and generate the inside contour of 184 parts per hour, two at a time.

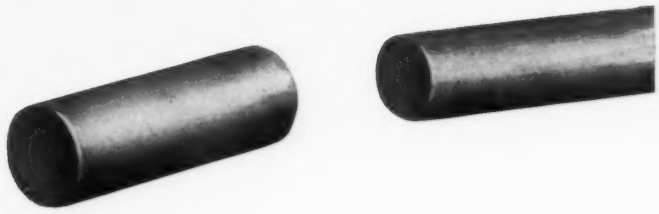
If you are anxious to get a similar production process underway quickly and economically, start now by calling your local Ex-Cell-O Representative. Or, if you prefer, write direct.

EX-CELL-O FOR PRECISION XLO

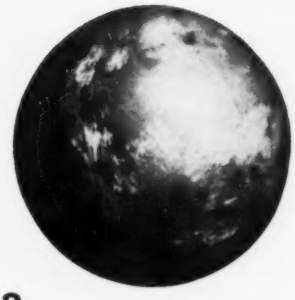
EX-CELL-O CORPORATION Machinery Division

DETROIT 32, MICHIGAN

EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT.



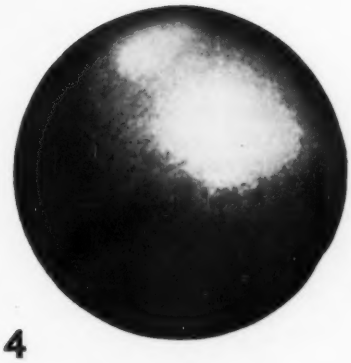
Making case-hardened balls from cold-heading wire

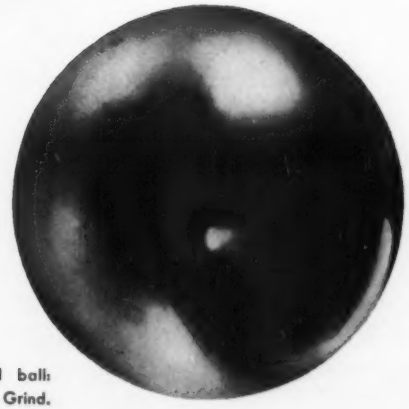


Changing a length of straight steel wire into a precision-finished bearing ball might seem like fitting a square peg into a round hole. Yet that's the way case-hardened balls are made, and with the proper type of Bethlehem ball-quality wire the results are gratifying indeed.

The trick really lies in producing the right wire for this severe heading operation, along with the dry grinding, hardening, tumbling, and finishing steps that follow. Bethlehem cold-heading quality wire passes these tests with flying colors.

In fact, Bethlehem wire has performed consistently for a wide variety of cold-headed parts, from rivets and screws to complicated custom-headed items. You can depend on Bethlehem wire to be uniform in quality, temper, and finish. Most important, you can count on Bethlehem to furnish the *right* steel wire for your job. Let us know if we can help you with any wire problem you may have. Just call our nearest district sales office.





Steps in making a case-hardened ball: 1. Wire cut to size. 2. Cold-head. 3. Grind. 4. Harden and Tumble. 5. Finish.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
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BETHLEHEM STEEL

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The IRON AGE

June 11, 1959—Vol. 183, No. 24

Digest of the Week in A

★Starred items are digested at right.

NEWS ARTICLES

BUSINESS IN POLITICS

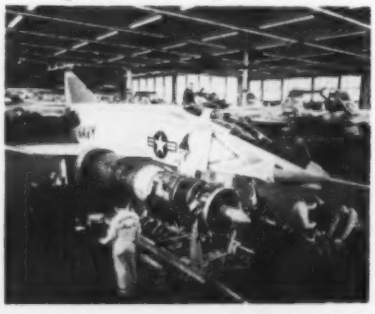
They Do Mix—Business is now taking a serious interest in politics, from precinct level to the capital. It pays off in better government and a better understanding of the business point of view. P. 91

BRASS MILLS

Battle Over Imports—The Copper and Brass Research Assn. has a new study indicating something must be done about imports or the U. S. industry might go to the wall. Importers object, say they'll tell the "true" story. P. 94

DEFENSE CONCEPTS

Industry Trends—A look ahead at explosive developments in defense indicates a pattern of defense contracting. It will mean more R & D, more team effort. P. 98



REPORT TO MANAGEMENT

Small Car Worries—It's no secret that many Detroit traditionalists view the coming of the small cars with misgivings. But new interest

Metalworking

POLISHING SHORTCUT: Looking over parts finished in the flat are G. A. Carlson (right), president and John Hackert, factory superintendent, of Acme Manufacturing Co. The fast-growing method stresses polish before forming. P. 128

and a breakthrough in precedent should mean inevitable gains for automakers and suppliers. P. 105

TIGHT MONEY POLICY

Here to Stay — Ike's critics in Congress say the high cost of borrowing is firing up inflation, not suppressing it. But the Administration is determined to discourage over-expansion. P. 111

FEATURE ARTICLES

DUPLEX NICKEL PLATE

For Zinc Die Castings — A double layer of nickel of the duplex type gives superior corrosion resistance to zinc die castings for outdoor exposure. It's a natural method for automakers, but others will welcome it for the same reasons. P. 132

AUTOMATIC QUALITY

Cures Gaging Delays — Automatic quality control is a must to keep pace with mass production of close tolerance parts. Delays and errors in manual inspection can also justify its use. It's the only way to keep up with demands for 100 pct inspection. P. 134

ALUMINUM RIVETS

For Magnesium Sheet—High-purity 5056 aluminum alloy, containing about 95 pct aluminum, 5 pct magnesium, turns out to be a completely satisfactory answer to the problem of finding a compatible rivet material for use with magnesium sheet. The riveted joints hold up at 800° F. P. 138

NUMERICAL CONTROL

For Small-Lot Precision—While emphasis to date has been on heavy contour machining, numerical controls can tackle the problems of short runs of extremely accurate small parts. It's a matter of choosing the right system. P. 140

HEAT TREAT LABORATORY

Serves Customers — A leading manufacturer of industrial furnace equipment is now providing a comprehensive heat treat laboratory service as well as promoting its own process research. P. 142

MARKETS & PRICES

APPLIANCE SALES

Good, But—Right now sales of appliances are running well above 1958's recession levels. But large dealer inventories have some manufacturers thinking about cutting back production. P. 96

AUTO PRODUCTION

Best May Since '55—Automobile production in May continued the fast pace of preceding months. But near-record new car inventories are causing some uneasiness. P. 107

GEAR MARKET

Business Is Better—April bookings in the gearing industry were at the highest level since May, 1957. New orders hit 255.6 on the AGMA index scale. P. 115

STEEL INVENTORIES

Are They High Enough?—Steel inventories will not be as high as expected when the steel labor contract deadline rolls around. But it seems that most users will be in pretty good shape. P. 175

PURCHASING EFFICIENCY

Reviewing Theory Helps—Often a review of purchasing fundamentals can throw new light on operating problems, says practicing P. A. and teacher. Many buyers find added night school work pays off. P. 176

NEXT WEEK

SURVEY SPENDING PLANTS

More Plants, Equipment—With the steel industry leading the way, metalworking has sharply increased appropriations for plant and equipment spending. Next week's issue will tell, industry by industry, where the money will go.

FIBER MATERIALS

How to Machine Them—More metalworking plants find they need to know how to machine and form vulcanized fiber. Next week's technical feature tells how to process it in the shop. Standard metalworking tools can do the job easily.

How B&W JOB-MATCHED TUBING helps you make a better product

... The complete range of sizes and types of finish plus close tolerances provide freedom of design ... *helps you make a better product*

... Quality controlled from start to finish helps provide a wide range of end use possibilities ... *helps you make a better product*

... Controlled mechanical properties provide flexibility of design ... *helps you make a better product*

These are just some of the reasons why it pays to specify B&W Job-Matched Tubing.

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B.F.Goodrich

V belt briefs

TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

The right way to install and run-in V belts

To get the most possible life out of a set of V belts you've got to install them and run them in properly:

To install V belts:

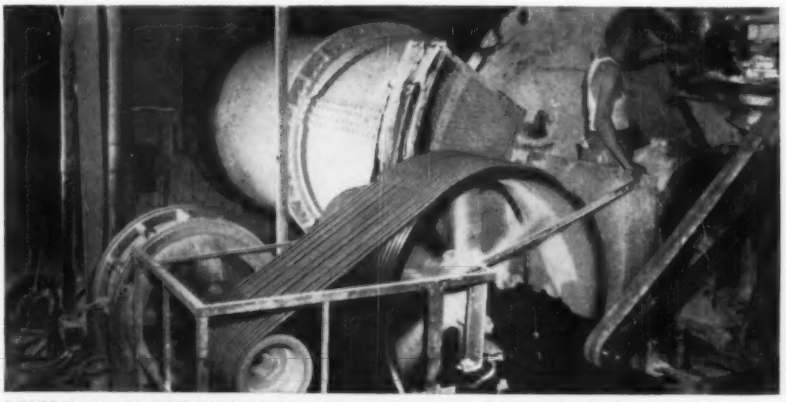
1. Move driver unit toward driven machine so that belts may be placed in sheave grooves by hand.
2. Work belt slack to top side of drive.
3. Move driver unit back into position, eliminating all belt sag.
4. Check sheave alignment.

To run-in V belts:

1. Start unit and operate long enough to permit belts to properly seat in grooves.
2. Stop unit. Adjust centers as necessary until all belts have proper tension.
3. Review adjustment from 24 hours to 48 hours after drive is in operation. This is important, for new belts stretch slightly and seat in grooves before reaching their working lengths.

It pays to keep belts stored properly

V belts should be stored in a cool, clean, dry place. Avoid heat and direct sunlight. Do not hang on nails or other small objects which might cause a sharp bend or tension that would result in a permanent set in V belt. Oldest belts should be used first to keep fresh stock. Matched belts should be banded together so they don't become separated.

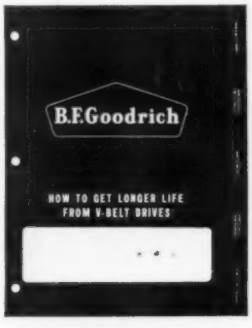


BELTS BOIL IN HOT SAND MILL—*The V belts driving this ball mill help grind hot sand, heated to 260°, to a fluffy powder used for fine glass, pottery, cosmetics. Ordinary V belts were lasting one to two years. B.F.Goodrich Grommet belts replaced them, have lasted over five years. Grommet belts stay cooler because they generate less internal heat and are made of a rubber that takes higher temperatures.*

What caused this V belt failure?

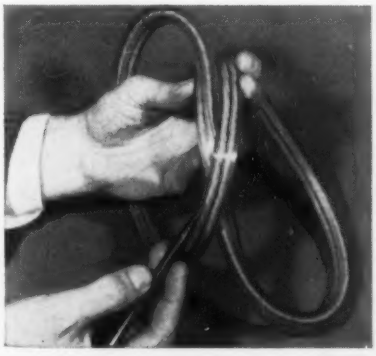
Answer: Prematurely worn sides are caused by grit, dirt or any such abrasive contact. Misalignment often causes wear on one side only. To prevent, align the sheaves, checking with straight-edge or cord. Keep belts and sheave grooves clean.

B.F. Goodrich V belt manual



Your B.F.Goodrich distributor has a new maintenance manual that tells you how to get longer life from your V-belt drives. Its 12 illustrated pages contain information on how V belts work, how to select V belts that fit, how to install, how to keep them running, and how to spot trouble.

Take a look inside with this X-ray of a Grommet belt



This model of a B.F.Goodrich Grommet belt was made of a transparent, flexible material so that you can see its grommet construction. The two endless loops you see are grommets, the load-carrying members of the B.F.Goodrich belt. These are made by winding heavy cord on itself to make an endless cord grommet.

In the actual belt, these grommets float in a bed of solid rubber. You can *see* why every part of the belt is equally flexible—there are no stiff plies to resist bending. Most cord failures occur where cords overlap. But in the B.F.Goodrich Grommet belt with endless cord construction this cause of failure is eliminated.

Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F.Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives.

B. F. Goodrich Industrial Products Company, Dept. M-608, Akron 18, Ohio.

B.F.Goodrich V belts

Questions and Answers on METALWORKING MACHINERY

...for those concerned with specifying or buying new equipment

QUESTION: Who is the largest national supplier of metalworking machinery equipment?

ANSWER: Ryerson is the largest by far – offering over 3800 different types and models produced by almost 100 of the nation's leading manufacturers.

QUESTION: What types of machinery does Ryerson offer?

ANSWER: The most complete line available anywhere, including the best type and right capacity for every metal-fabricating job of:

Bending	Forming	Punching	Shearing
Braking	Hoisting	Rolling	Threading
Drilling	Pressing	Sawing	Welding

QUESTION: What advantages do I get by buying from Ryerson?

ANSWER: (1) Widest selection, (2) Unbiased recommendations, (3) Double guarantee: the manufacturer's warranty backed by Ryerson assurance of satisfaction, (4) Greater continuing interest because we also value your steel and aluminum buying potential, (5) A nation-wide organization of machinery specialists backed by 117 years of Ryerson experience in working with metal fabricators and in using much of the equipment in its own steel service operations.

MACHINERY DIVISION

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A Steel Strike: Why There Shouldn't Be One

The key to the steel labor outlook is in Dave McDonald's hands. Not only is the White House watching him, but so is the public. And so are workers who get far less than do the high paid steelworkers.

This year Dave really has nothing to complain about. Everyone in the country wants a rest from the wage-price spirals. If he runs against the rip tide he could lose out for himself—and for his men.

Steelworkers do not want a strike. They sense that if they walk out—as they would if Dave ordered it—they will lose far more than they might get. They are right as rain this time.

The President doesn't want a strike. But more than that he doesn't want any kind of a settlement which would raise steel prices. He is going to get what he wants on that score. That's for sure.

Mr. McDonald is on the top of the heap. He has come up fast in the past several years. It is always hardest to stay on top. A wrong move by a top runger often means curtains. Dave doesn't want that.

The steel industry just isn't going to settle for any more agreements such as it has in the past. That era is over—kaput. Steel firms are worried no end about high prices, high wages and serious foreign competition for which they are bracing themselves. It will be no picnic in years to come.

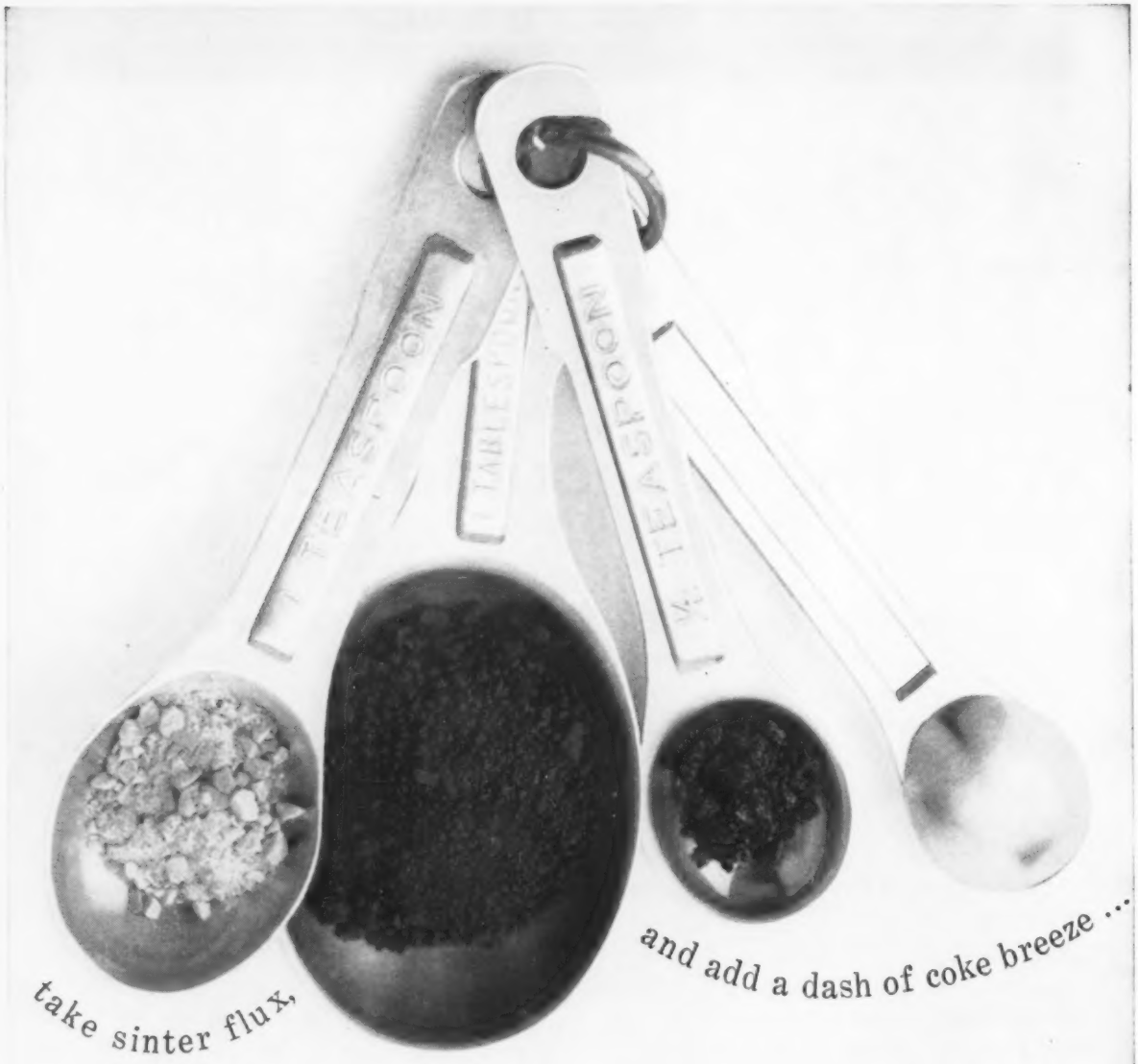
The man on the street at last has gotten the idea that inflation doesn't pay. Even the creeping kind looks a little fishy to him. All he knows is that the more he gets the more he has to pay. What he wants now is more fringe for old age, for sickness and for unemployment. That he understands.

There are some top labor leaders who privately are dead set against a steel strike. They know or profess to know that it would be a long one. It would rob the economy of purchasing power, thus throwing workers other than steelworkers out of work—just at the "wrong" time. They may have little influence with Dave but their views are significant.

A steel strike, if it comes, will be a most disastrous one. The blame for it would have to go to Dave McDonald if he turned down a chance to get a non-inflationary wage pact for one, two, or three years.

Tom Campbell

Editor-in-Chief



That's exactly what Inland's technical chefs will do when its giant, new sintering plant is completed in June. A single day's mix—4300 tons of iron ore particles, 500 tons of crushed limestone, 250 tons of fine coke—will bake a cake of clinkers which can be fed directly into blast furnaces. Result—better, faster reduction of raw iron ore to pig iron, blast furnace production upped 10%—*more and more Inland steel to feed the hungry production lines of fast-expanding Mid-America manufacturing!*

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INLAND LIME & STONE COMPANY* *Division

Record for Steel Shipments

A new record for steel shipments may have been set in May. April shipments of 8.6 million tons were an all-time high. This compares with the previous record of 8.3 million in March of 1956. Authorities estimate the industry has capacity to ship 9.0 million tons a month on a sustained basis and 9.3 million for a short period.

Quality Copper Billets

A high-production casting setup for extrusion billets is based on the semi-continuous casting process. It's producing copper billets of a quality superior to that obtained by the conventional method of casting in individual molds. The setup consists of a pair of semi-continuous casting machines, mounted in tandem. The underpouring method is used to introduce the molten de-oxidized copper into the molds, eliminating internal porosity and inclusions.

Water-Base Paint in Tests

Undergoing field tests are several cars that have been painted with water-base emulsion paint. Indications are that the finishes hold up well in service. Work is also being done on formulations for painting outdoor steel structures. Predictions are that paints for such outdoor service will be on the market in 2 years.

Centrifugal Separator

A new automatic continuous separator is particularly suitable for separation processes operating around –30°F and for applications where construction metals containing nickel and copper must be avoided. The setup employs the "ter meer" principle of centrifuging, combined with a controlled system of pressurizing and depressurizing.

Hearings on Transportation

Transportation hearings in the Senate may lead to a new campaign against secondary boycotts. Senate Commerce subcommittee later this month is to have hearings on bill affecting common ownership of transport modes. One measure would bar one transport mode from controlling another. And it would make secondary boycotts unlawful. This aspect has not been emphasized, but it's certain to stir lively debate.

Foreign Forgings Compete

Newest threat to domestic metalworking industry is reported in the field of forgings. One Midwest company has commitments to import Italian forged parts worth almost $500,000 over a year's period. Trade experts expect this type of competition to loom larger with opening of the St. Lawrence Seaway.

Rocket-Engine Insulation

A new low-cost insulating material is expected to extend the burning time of present high-performance solid-fuel rocket motors to three to four times the present burning periods of one minute or less. During recent test firings with flame temperatures of more than 5500°F, the new insulation held the exterior of the rocket motor case to about 200°F at the end of 3½ minutes.

New Union Committee

The AFL-CIO is going to give a boost to member unions in their upcoming all-out bid to enroll white collar workers. New Professional and Technical Workers Committee of the federation will help unions try to break down white collar resistance to unionization.

Use Small-Business Capacity

Search is on for complete data on small research firms which can take on space projects. National Aeronautics and Space Administration is assembling the information. The agency is sensitive to complaints that it ignores small companies in awarding contracts. NASA says it plans to give contract requirements widest publicity. NASA hopes to make big contractors aware of small business capacity for subcontracting.

Questions and Answers about ELCIDE 75

Here's what you'll want to know about this new bacterial inhibitor for soluble oil emulsions:

Q: What is Elcide 75?

A: Elcide 75 is a new bacterial inhibitor for standard duty soluble oil emulsions. Chemically, it is a combination of Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium *o*-phenylphenate in a concentrated solution.

Q: What does Elcide 75 do?

A: Elcide 75 controls bacteria that contaminate soluble oil emulsions. Since both chemical ingredients are anti-bacterial agents, Elcide 75's double action controls a far wider range of bacteria than the commonly used germicides.

Bacteria like these prematurely spoil emulsions. Elcide 75 stops their damage.

Q: Why is bacteria control important?

A: Bacteria enter emulsions through the air, water, and plant debris. They multiply rapidly and cause odor, corrosion, and premature emulsion breakdown. This compounded damage costs millions of dollars each year in higher maintenance and production costs. Bacteria control reduces these expenses.

Q: How does Elcide 75 lower operating costs?

A: The use of Elcide 75 can increase emulsion life as much as 5½ times. You use less soluble oil. Fewer man-hours are spent servicing machines and disposing of waste oil. And, because machines run longer between emulsion changes, production is increased proportionately.

Q: What is the exact dollar return from Elcide 75?

A: No exact figure can be established because conditions vary between plants. The type of metal, machines, and operations involved, the coolant, and general plant housekeeping are all factors that help determine savings due to Elcide 75. The best way to measure its value is to try Elcide 75 and compare the results with untreated machines under your plant conditions.

Q: How is Elcide 75 used?

A: One ounce of Elcide 75 is added to each four gallons of emulsion. You know you have a safe, effective treatment because you control the dosage.

Q: Is Elcide 75 safe to employees?

A: Yes. It also eliminates objectionable odors and certain bacteria that may cause skin infections.

Q: Will Elcide 75 harm machinery or products?

A: No. In fact, Elcide 75 controls bacteria that often cause acidic corrosion and shortened tool life.

Q: Is more information available on Elcide 75?

A: Yes. Complete data on compatibility, disposal, stability, safety, and other pertinent factors are available on written request.

Q: Where can I buy Elcide 75?

A: Elcide 75 is sold only through selected distributors. To place your order, or for the name of your nearest distributor, write Eli Lilly and Company, Agricultural and Industrial Products Division, Indianapolis 6, Indiana; or telephone MElrose 6-2211.

ELCIDE 75™

PATENT PENDING

KEEPS COOLANTS FRESH AS A DAISY!

Package	Price per Gal.
1-gal. (4 per case), polyethylene	$8.50
5-gallon, polyethylene	$8.00
55-gallon, stainless steel	$6.50

(Lilly's brand of bacterial inhibitor for cutting fluids)

ELI *Lilly* AND COMPANY • AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION • INDIANAPOLIS 6, INDIANA

LETTERS FROM READERS

Call for Clarity

Sir—We are deeply grateful for the fine story you carried on our vice president, Robert B. Young, in your May 7 Salute.

However, there is a point we should like to clarify. The heading on the story presented Mr. Young as the "Father" of the Titan Missile. It would have been more accurate to say "Father of the Titan Engines."

Aerojet's role in the Titan missile has been to develop the rocket engines or propulsion system. This work was done under the leadership of Mr. Young.

However, there is much more to a missile than the engines and we strongly suggest that credit for the overall planning and advanced technological direction that went into the development of the Titan weapon system properly should go to a group of dedicated persons in the Air Force Ballistic Missile Division, the Martin Company, and Space Technology Laboratories. It was this group which actually did the work from which the Titan program was born. — J. J. Lipper, Manager of Public Relations, Sacramento Plants, Aerojet-General Corp., Sacramento, Calif.

Prices and Wages

Sir—Your editorial in the May 14 issue (The Die Is Cast—The Pressure Stays On) impels me to take another side as it appears from the standpoint of a steel user and an engineer.

The editorial seems to criticize President Eisenhower for taking a stand on eliminating the causes of inflation. I feel a president who does not take an active interest in curbing inflation would not be performing his duty. I do not believe this kind of interest would be termed governmental interference.

You make a statement that "it is proper and good business to pass on part of higher wage costs." What I would like you to consider is the reduction of costs through increased efficiency of labor, methods, and equipment.

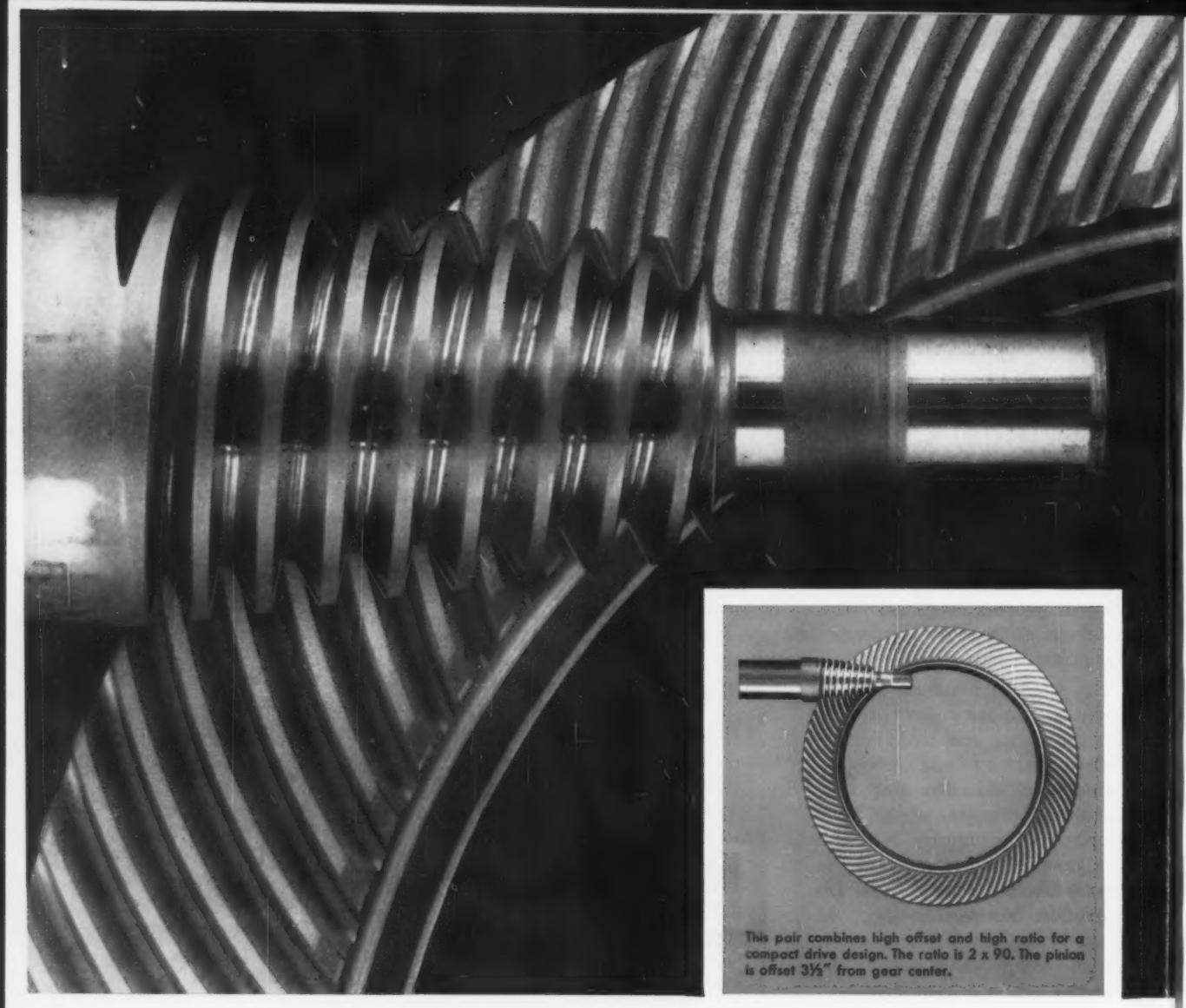
Also, the proper division of savings due to lower costs among management, labor, and the consumer thus resulting in a price decrease at a fair increase to both labor and management.

I believe you will agree if we continue to raise the price of steel we will face a very serious problem of competing with imports on a much greater tonnage basis. This will certainly affect our steel industry so that both labor and management will be the losers.—T. A. Green, Staff Engr., Bailey Meter Co., Cleveland.

▪ If wage costs go up, industry has no choice but to pass on any cost which exceeds productivity gains. The steel industry would undoubtedly be glad to reduce prices if the rate of productivity gains ever gets to the point where it exceeds the rate of wage costs.—Ed.

Steel Profits

Sir—Re your article on p. 55 of the May 7 issue reporting steel company profits: The average man on the street that casts 75 pct of the votes ought to look at the money the steel companies are making in '59. They can raise wages for the next 3 years and not increase the cost of steel. Why not compare '59 with a normal year, not a slump year? You and I know the score. But the average voter or union worker doesn't.—W. C. Griffin, Owner, Allied Iron Works, Inc., Fort Worth 5, Texas.



This pair combines high offset and high ratio for a compact drive design. The ratio is 2 x 90. The pinion is offset 3½" from gear center.

See how the teeth "wrap around" this high-reduction pinion

This is a high-ratio hypoid gear. In principle, it is not different from more conventional hypoids produced by the Gleason Works. *But . . .*

If you look closely at the pinion, you'll notice that the teeth tend to "wrap around" it. This design is extremely well suited for high reduction, strength and compact design.

The result is a conical (or sometimes cylindrical) pinion which permits *continuous tooth action—even with just one or two teeth!* Compared to corresponding bevel pinions, its diameter is greater for higher strength. An extended shank on cylindrical pinions makes *very rigid* straddle mountings practical.

You can design a *compact* unit, because high offset is possible! For high-offset *or* high-ratio pairs, the "wrap around" tooth design provides an extra measure of the smooth, quiet tooth action of hypoid gears.

High-ratio hypoids can be cut on the same Gleason equipment that is used on more familiar spiral bevel gears and hypoids. You can also use the same testers, quenching presses and other auxiliary Gleason equipment you're using now. Grinders are available for applications requiring precision finish.

High-ratio hypoids can be produced by the Gleason Works for ratios of 1:10 or 1:40 or even higher. They are finding a growing number of applications in such diverse fields as farm machinery, instrumentation and office equipment.

You can get more information about Gleason high-ratio hypoid gears by writing for free literature. Submit your prints for recommendations.

GLEASON WORKS

1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

Kit for Congressmen

While in Washington recently to cover a story one of our editors was intrigued by a column he read in Roll Call—the Newspaper of Capitol Hill.

According to the article, a firm named Cliche Councilors, Inc., will provide ready-made, sure-fire, all-purpose recess kits for congressmen on the way home.

The contents include:

Grass Roots Sonar — A finely-attuned ear-trumpet sensitive to the slightest rustle for sounding out grass roots opinion.

Sentiment Poll—Six-foot poll for making realistic appraisals of feelings—"with the bark on" as they say on Madison Ave.

Pulse-Feeler—"Put your fingers on the pulse of the constituency, hold clock to ear, and listen to ticking. If it's a smooth, even beat, you're fine. If it's angry, erratic, uneven, you're beat. If there's no pulse, you're safe—nobody cares what you're doing."

Fence-Mender—Compact assortment includes hammer for driving home a point; a box of tacks to nail down votes; pliers to twist arguments, and a brand new disaffectant to woo back disaffected constituents. Also plastic sack of political plums.

Back Home Ties - Renewer—Scientifically-compiled list of first names which will give a congressman 90 pct accuracy in calling a stranger by a first name.

Snowed Under

We knew the government did a lot of printing. But now comes word, via the Central Manufacturing District Magazine, on just how much.

A curious senator asked all federal agencies to send him copies of their current books and other literature. He received 83,000 works.

Subjects included How to Trap Cats, Recipes for Frying Muskrats in Wine, and The Status of North American Fleas.

An Invitation to the Motorist

IRON AND STEEL'S BIRTHPLACE: Drivers inbound toward Boston are greeted by this billboard inviting them to visit the birthplace of "metals," the Restored Iron Works at Saugus, Mass. Billboard was erected by the Boston Envelope Company, Dedham, Mass.

COMING EXHIBITS

Material Handling Show—June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Finishing Show — June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

Instrumentation Show — Sept. 21-25, International Amphitheatre, Chicago. (Instrument Society of America, 313 Sixth Ave., Pittsburgh 22.)

Metal Show—Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

JUNE

Pressed Metal Institute — National sales conference, June 11-12, Bedford Springs Hotel, Bedford, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Manufacturing Chemists' Assn.— Annual meeting, June 11-13, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, 1825 Connecticut Ave., N. W., Washington 9, D. C.

National Assn. of Purchasing Agents—Convention and Inform-A-Show, June 14-17, The Waldorf-Astoria, New York. Association headquarters, 11 Park Place, New York.

The American Boiler Manufacturers Assn. — Annual convention, June 14-17, The Homestead, Hot Springs, Va. Association headquarters, 4062 Mayfield Rd., Cleveland.

The American Society of Mechanical Engineers—Semi-annual meeting, June 14-18, Chase-Park Plaza Hotel, St. Louis, Mo. Society headquarters, 29 W. 39th St., New York.

(Continued on P. 16)

EXHIBITS, MEETINGS

(Continued from P. 15)

Association of Iron & Steel Engineers—Western meeting, June 15-17, Hotel Utah, Salt Lake City, Utah. Association headquarters, 1010 Empire Bldg., Pittsburgh.

Alloy Casting Institute — Annual meeting, June 21-23, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

American Society for Testing Materials—Annual meeting, June 22-26, Chalfonte-Haddon Hall, Atlantic City, N. J. Society headquarters, 1916 Race St., Philadelphia.

Industrial Safety Equipment Assn., Inc.—Annual meeting, June 23-26, Point Clear, Ala. Association headquarters, 420 Lexington Ave., New York.

JULY

Truck Trailer Mfrs. Assn.—Annual summer meeting, July 13-15, The Homestead, Hot Springs, Va. Association headquarters, 710 Albee Bldg., Washington, D. C.

Metal Lath Mfrs. Assn.—Meeting, July 21-22, Statler Hotel, Buffalo, N. Y. Association headquarters, Engineers Bldg., Cleveland.

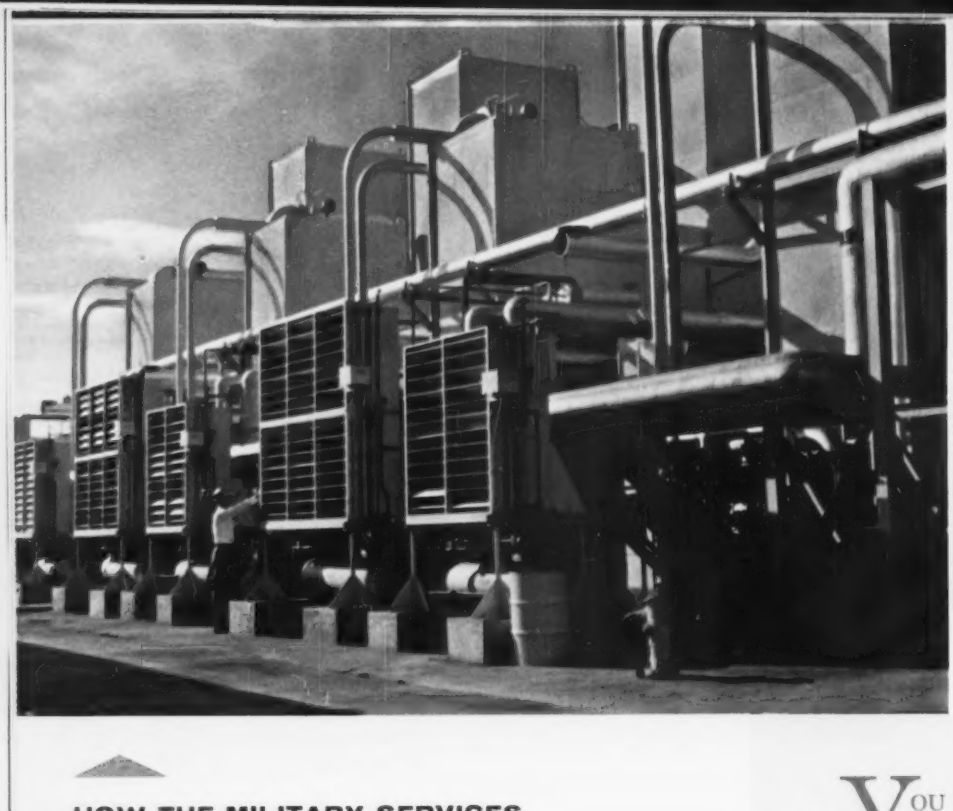
Assn. of Roller & Silent Chain Mfrs.—Summer meeting, July 22-23, Grand Hotel, Mackinac Island, Mich. Association headquarters, 3343 Central Ave., Indianapolis.

SEPTEMBER

Pressed Metal Institute — Annual meeting, Sept. 13-17, Estes Park, Colorado. Institute headquarters, 3673 Lee Rd., Cleveland.

American Mining Congress—Metal mining-industrial minerals convention, Sept. 14-17, Denver, Colorado. Congress headquarters, 1200 18th St., N. W., Washington, D. C.

American Die Casting Institute—Annual meeting, Sept. 15-18, Edgewater Beach Hotel, Chicago. Institute headquarters, 366 Madison Ave., New York.



Liquefied gases from Air Products equipment supply all major U.S. missiles.

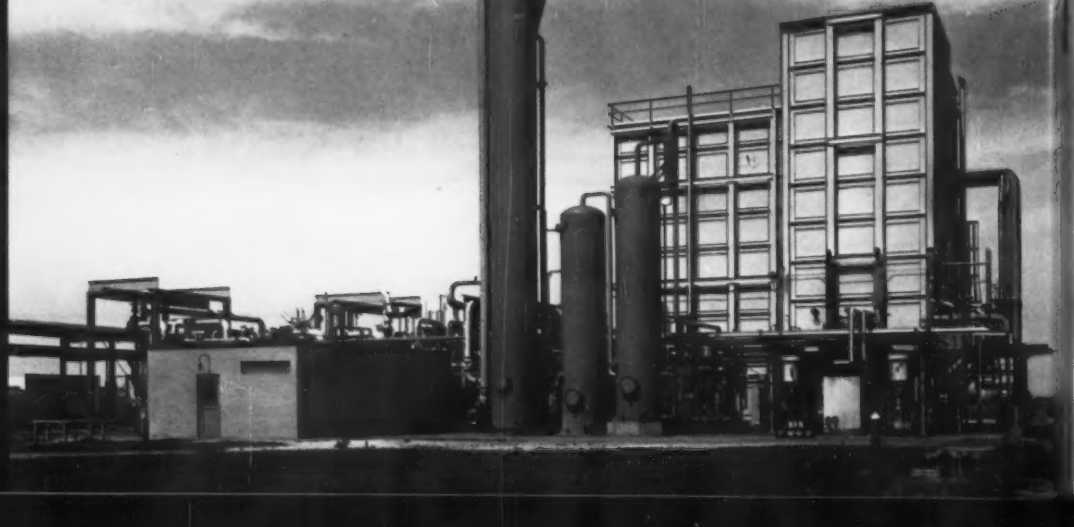
HOW THE MILITARY SERVICES use Air Products CAPACITY

Large-scale low-temperature systems, ultra pure gases and liquids, and a broad range of specialized cryogenic "hardware" are supplied by Air Products to the military. When large quantities of liquefied gases were needed for rocket engine development and missile testing, Air Products quickly designed, manufactured and put on stream complete production facilities. Typical facilities paid for themselves in less than a year's time. Air Products also provides a broad line of portable air separators for field and shipboard use . . . and has advanced the development of exotic fuels. And, Air Products produces advanced design liquefied-gas pumps, cryogenic storage and transfer systems, electronic cooling devices and refrigeration and distillation equipment for military uses.

YOU will find here tangible evidence of a growing technology. Applying "Cryogenics" (the science of low temperatures) and engineering broad new routes to low-cost, high-purity industrial gases is the main business of Air Products.

Air Products combines original research knowledge with engineering and manufacturing capabilities and substantial operating experience. These integrated activities have

These companies and many others are the beneficiaries of major facilities provided by Air Products:
Acme Steel • Bethlehem Steel • Brazilian National Steel • Celanese • Dow Chemical • du Pont • Grace Chemical • Great Lakes Steel



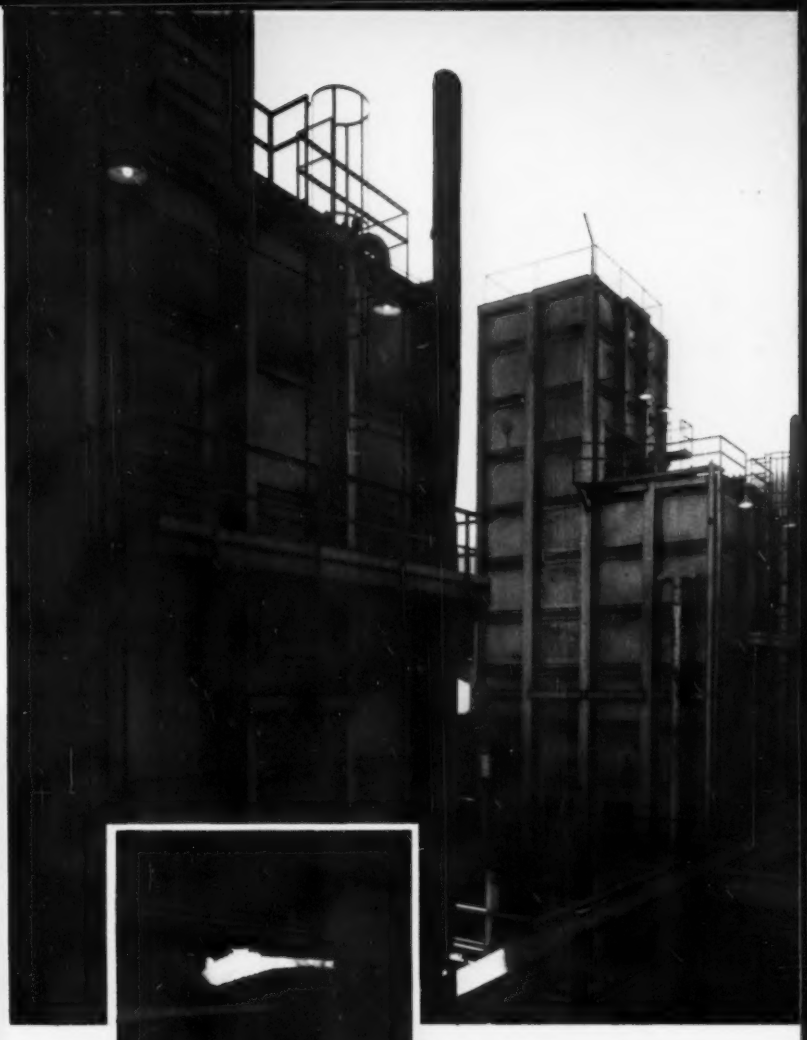
Petrochemical plants use Air Products equipment in feedstock preparation and product purification

HOW THE STEEL INDUSTRY
uses Air Products CAPACITY

In the blast furnace, the open hearth and the new converter processes — Air Products oxygen efficiently increases steel mill capacity. Annealing nitrogen and other gases are also provided on a low-cost tonnage basis.

Air Products' complete gas supply systems are installed at steel mills without capital investment or operating worries on the part of the users. Continuity and reliability of supply are assured. On-site facilities pioneered by Air Products reduced the cost of oxygen 80% in 12 years — transforming oxygen from a costly chemical to a practical working utility.

Further progress marks on-the-job development work now continuing around the clock at major steelmaking facilities. Entirely new metallurgical techniques . . . and new profits . . . are available through Air Products.



Air Products pipeline oxygen serves the Basic Oxygen Furnace Process.

helped provide many Air Products customers with distinct competitive advantages.

Air Products is the world's leader in APPLIED CRYOGENICS — the practical and profitable use of low-temperature science for industry.

Perhaps this CAPACITY can help solve your problems — in cryogenics, in industrial gas supply systems, or in some new area where "ground rules" are yet to be established.

• Jones & Laughlin Steel • Osaka Oxygen • Spencer Chemical • Sun Oil • U.S. Government - All major research and defense agencies • United States Steel • Venezuelan Ministry of Mines • Weirton Steel

HIGH PURITY GASES AND LIQUIDS —available like any other utility with the help of Air Products CAPACITY

. . . The supply is dependable . . . the price guaranteed . . . with Air Products on the job.

HOW THE CHEMICAL INDUSTRY
uses Air Products CAPACITY

Air Products low-temperature systems permit many modern chemical plants to improve operating efficiency and end-product quality — and to develop new processes and products. This results from the ready availability of low-cost tonnage quantities of oxygen, nitrogen, hydrogen, ammonia and methanol syn-gas, carbon monoxide and hydrocarbons such as purified methane, acetylene and ethylene. Low-temperature separations of gaseous mixtures now make it practical to recover valuable components from natural gas, refinery off-gases, coke-oven gas and other "waste" gases. The versatility of cryogenics—as applied by Air Products—works profitably for the chemical industry today . . . offers unparalleled future opportunity in this fast-growing industry.

Air Products
...INCORPORATED

Perhaps you, too, can profit from

Air Products CAPACITY*

To find the new opportunities Applied Cryogenics may offer in the manufacture, separation and purification of Industrial Gases.

To provide integrated research, engineering, manufacture and operation . . . complete services under a single responsibility.

To forecast accurately and guarantee total cost, superior performance and reliability.

To put entire gas supply complexes to work for you *without capital investment on your part.*

Air Products CAPACITY has helped our customers to step out ahead of competition in familiar fields . . . to open up entirely new areas of opportunity through new products or processes. A letter or telephone call will put Air Products CAPACITY to work for you.

Information is available on:

superconductivity
frozen free radicals
biological preservation
environmental control
low-temperature
catalytic reactions
infrared detection
masers

purification and liquefaction of:

argon
carbon monoxide
ethylene
fluorine
helium
hydrogen
krypton
methane
neon
nitrogen
nitrogen trifluoride
oxygen
oxygen difluoride
ozone
xenon

Air Products . . . INCORPORATED
ALLENTOWN, PENNSYLVANIA

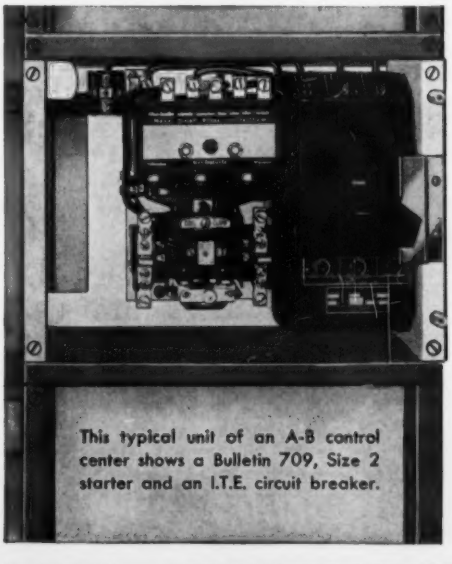
Air Products (Great Britain) Ltd., London
Air Products, S. A., Caracas
Dynamic Research, Inc., Los Angeles

Advanced Design Features in a Control Center . . .

ALLEN-BRADLEY

CONTROL CENTERS

. . . offer tops in
FLEXIBILITY • SAFETY
QUALITY APPEARANCE



This typical unit of an A-B control center shows a Bulletin 709, Size 2 starter and an I.T.E. circuit breaker.

Allen-Bradley control centers are the "label" of a modern plant. They make neat, centralized installations and—where this is practical—do away with individual starter mountings and complicated wiring. The control center may even reduce installation cost—as compared with using individual starters. Here are some of the up-to-date design features which make the A-B control centers so popular.

NEW SPACE SAVING DESIGN—New Bulletin 798 control centers save floor space . . . provide up to 8 units in a 90" high control center unit.

PREMIUM QUALITY FINISH—An exclusive A-B finishing process assures that your control center will retain its attractive appearance over the years. Each piece is *individually* cleaned and phosphated *before* assembly—there are no "bare spots" where corrosion can have a start. Then a rust-resisting primer and a dense finish coat are baked on, providing a fine, tough, and lasting surface.

FLEXIBILITY—A-B control centers are readily adaptable to changes in operating needs—integral plug-in units can be added or modified without internal rewiring. Entire sections are easily added as needed.

SUPERIOR PERFORMANCE—Using the popular A-B solenoid starter—with only ONE moving part—assures millions of trouble free operations. Their double break, silver alloy contacts *never* need servicing.

For "tops" in control centers, you owe it to yourself to investigate Allen-Bradley's Bulletin 798. Write for complete information.

ALLEN-BRADLEY

QUALITY MOTOR CONTROL

Allen-Bradley Co., 1341 S. First St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

MAKE YOUR OLIN ALUMINUM DISTRIBUTOR YOUR METALS SERVICE CENTER

Your Olin Aluminum Distributor can help you operate with minimum inventory (at a great saving of your own floor space). He stocks both ferrous and non-ferrous metals, and is ready to give you—

- **The fastest possible service**
- **Aluminum to meet your precise requirements**
- **Free extra storage space by minimizing your inventory**
- **Expert technical assistance**

COIL, FLAT SHEET AND PLATE... ROD AND BAR... EXTRUDED SHAPES... PIPE AND TUBING... CASTING ALLOYS

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NAtional 5-6411

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NAtional 2-5808

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BElmont 5-1500

BALTIMORE 24
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P.O. Box 5295
DIckens 2-4000

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Kelco Metal Products Co.
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HUbbard 2-1737

WORCESTER
Kelco Metal Products Co.
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PLeasant 3-7625

MICHIGAN
DETROIT 34
Production Steel Products Inc.
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TW. 3-5000

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Keelor Steel, Inc.
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FEderal 3-4291

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NORTH KANSAS CITY
A. M. Castle & Co.
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GRand 1-3666

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475 Jersey Avenue
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CHarter 7-8400

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Seneca Steel Service Inc.
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Riverside 7920

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FRanklin 5-5508

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PRospect 1-6595

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VUlcan 3-4972

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MElrose 4-1492

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OLIN ALUMINUM®

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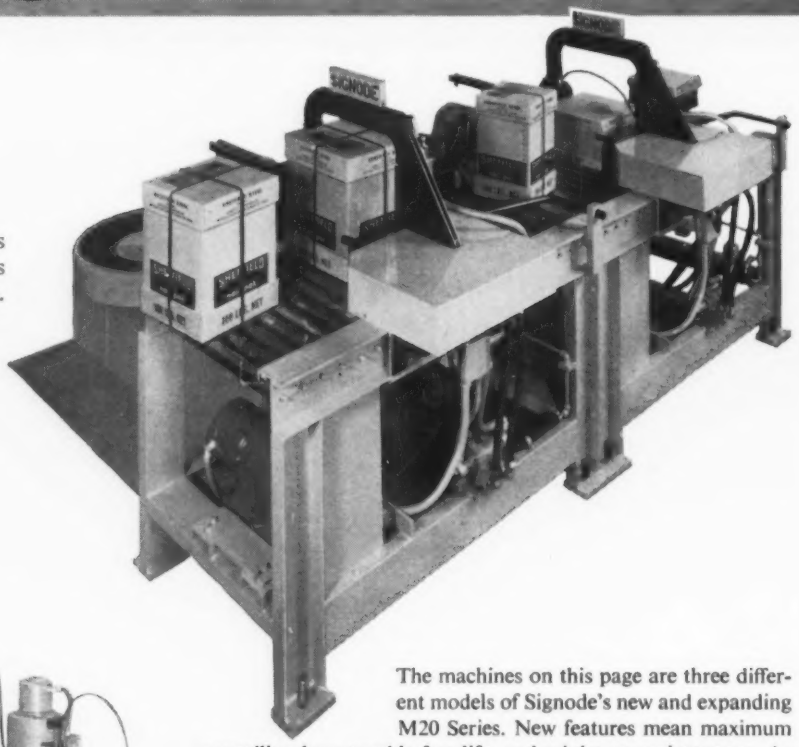
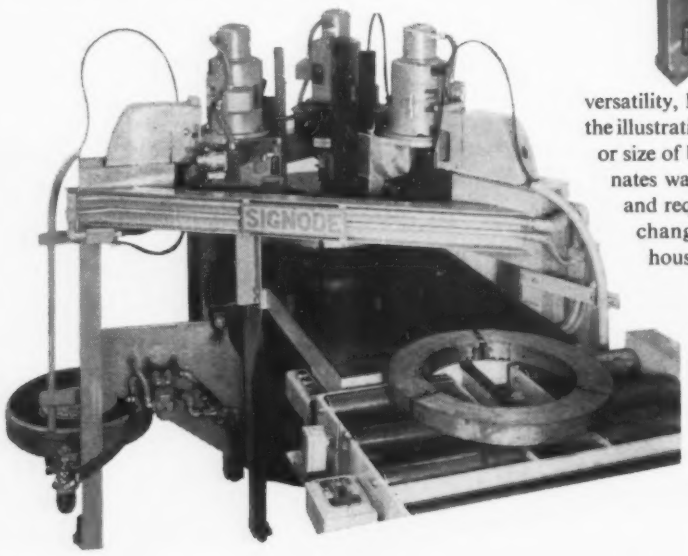
Signode machines

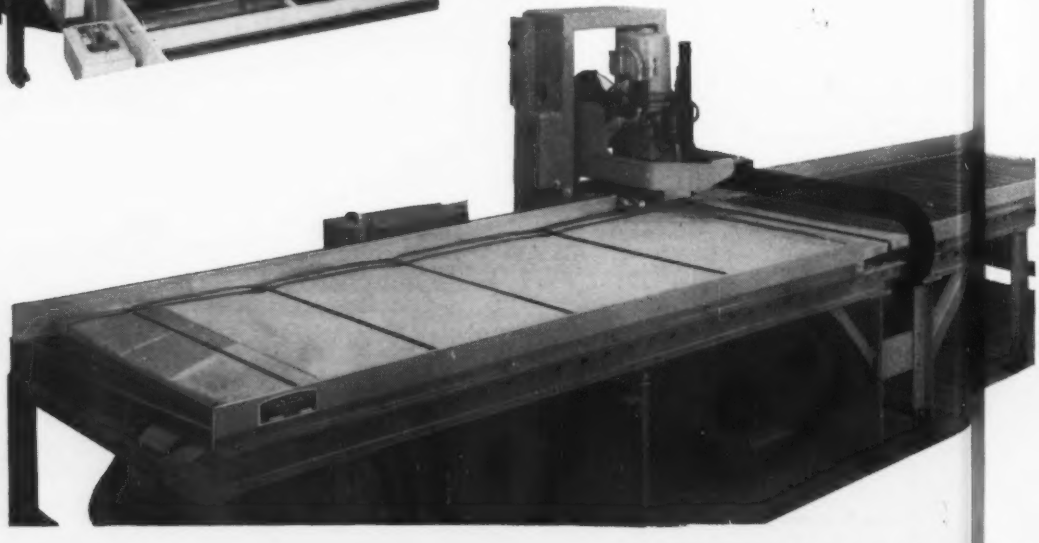


Operatorless
cross-strapping of nail cartons
in mixed sizes.

Operatorless strapping of strip
steel coils, 3 straps simultaneously,
up to 1,000 coils per hour.

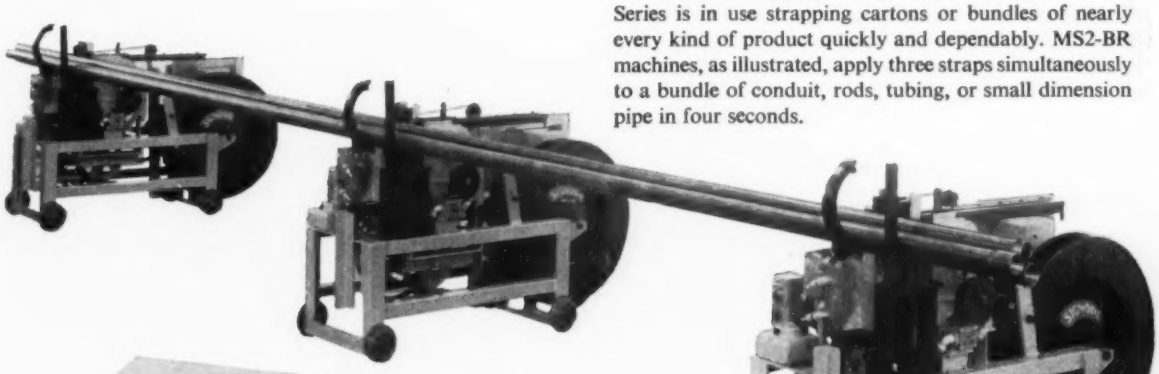


The machines on this page are three different models of Signode's new and expanding M20 Series. New features mean maximum versatility, long trouble-free life, and minimum maintenance. As the illustrations show, automatic strapping of practically any shape or size of bundle or container is possible. Overlap control eliminates waste of strap. Tension is easily and accurately pre-set, and requires no further adjustment unless type of package is changed. Vital working parts are protected by a sealed housing and run in a bath of oil. With an M20, strapping can be applied vertically or horizontally...any type of Signode PSM grade strapping can be used, in sizes from $\frac{1}{8}$" to $\frac{3}{4}$". Seals can be lithographed with your trademark in color. Operation can be completely automatic (operatorless), or semi-automatic (push-button controlled).

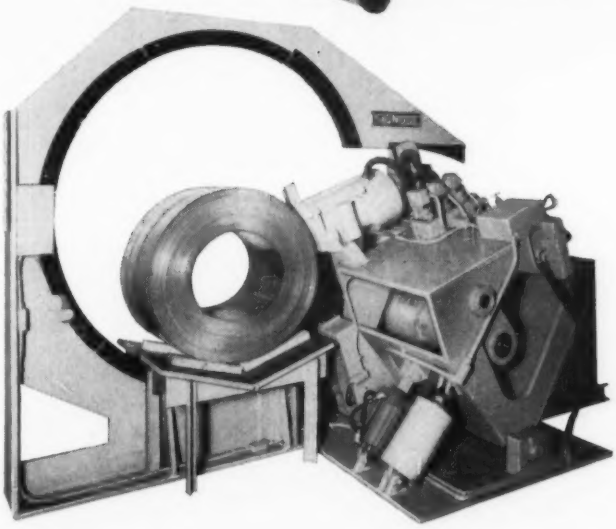


Operatorless strapping
of plastic sheet packs.
Number of straps
per pack is optional.

reduce packaging costs



Push-button strapping of pipe. This "work horse" M2 Series is in use strapping cartons or bundles of nearly every kind of product quickly and dependably. MS2-BR machines, as illustrated, apply three straps simultaneously to a bundle of conduit, rods, tubing, or small dimension pipe in four seconds.



Operatorless circumferential strapping of aluminum coils. Strapping is automatically centered on coils from 30″ to 72″ O.D. Capacity is 300 to 400 coils per hour. Other MH Series machines put 300 to 360 straps per hour on hot or cold strip steel coils or rod or wire coils...have been proved dependable in as much as ten years of the hardest kind of steel mill service.

Every day hundreds of plants prove their economy and dependability

Signode machines strap faster and at less cost—and do it dependably, with uniform tension on every strap. Tensionable steel strapping is low in cost to begin with...and high in strength to ship with. Signode has unparalleled experience in building and applying over 30 different types of these machines. Improved flow, less waste, better handling, safer transit, and lower costs nearly always result. Signode Service includes operator training and fast mechanical service on a local basis, nationwide. All of these machines are available on either an annual rental or single payment basis. It will pay you to talk to the Signode man near you, or write:

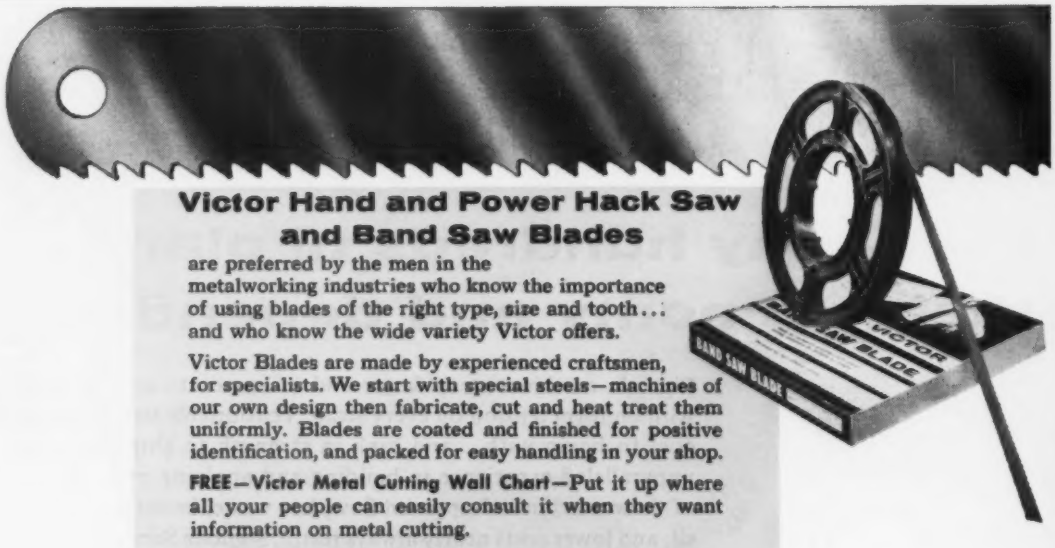
First in steel strapping

SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

specialists in the field...



Victor Hand and Power Hack Saw and Band Saw Blades

are preferred by the men in the metalworking industries who know the importance of using blades of the right type, size and tooth... and who know the wide variety Victor offers.

Victor Blades are made by experienced craftsmen, for specialists. We start with special steels—machines of our own design then fabricate, cut and heat treat them uniformly. Blades are coated and finished for positive identification, and packed for easy handling in your shop.

FREE—Victor Metal Cutting Wall Chart—Put it up where all your people can easily consult it when they want information on metal cutting.

Victor Metal Guidebook—Crammed with helpful information on metal cutting, how to do the job best. Write for your free copies.

INDUSTRIAL DISTRIBUTORS · THE RIGHT HAND OF PRODUCTION

VICTOR

SAW WORKS, INC., Middletown, N. Y., U. S. A.

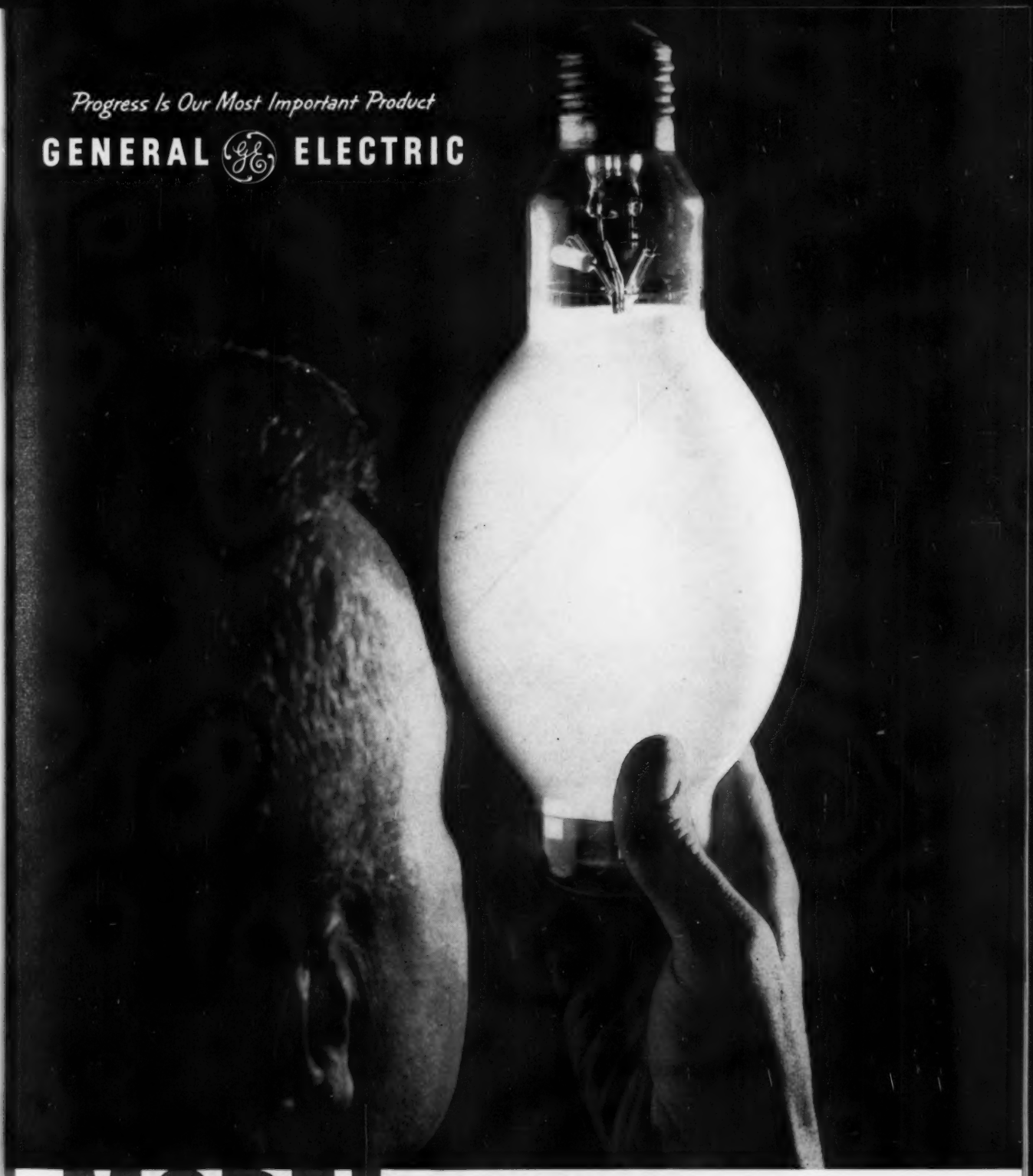
Warehouses in Chicago, Denver, Los Angeles & Portland, Ore.

Makers of Hand and Power Hack Saw Blades, Frames, Metal and Wood Cutting Band Saw Blades

1663

Progress Is Our Most Important Product

GENERAL ELECTRIC

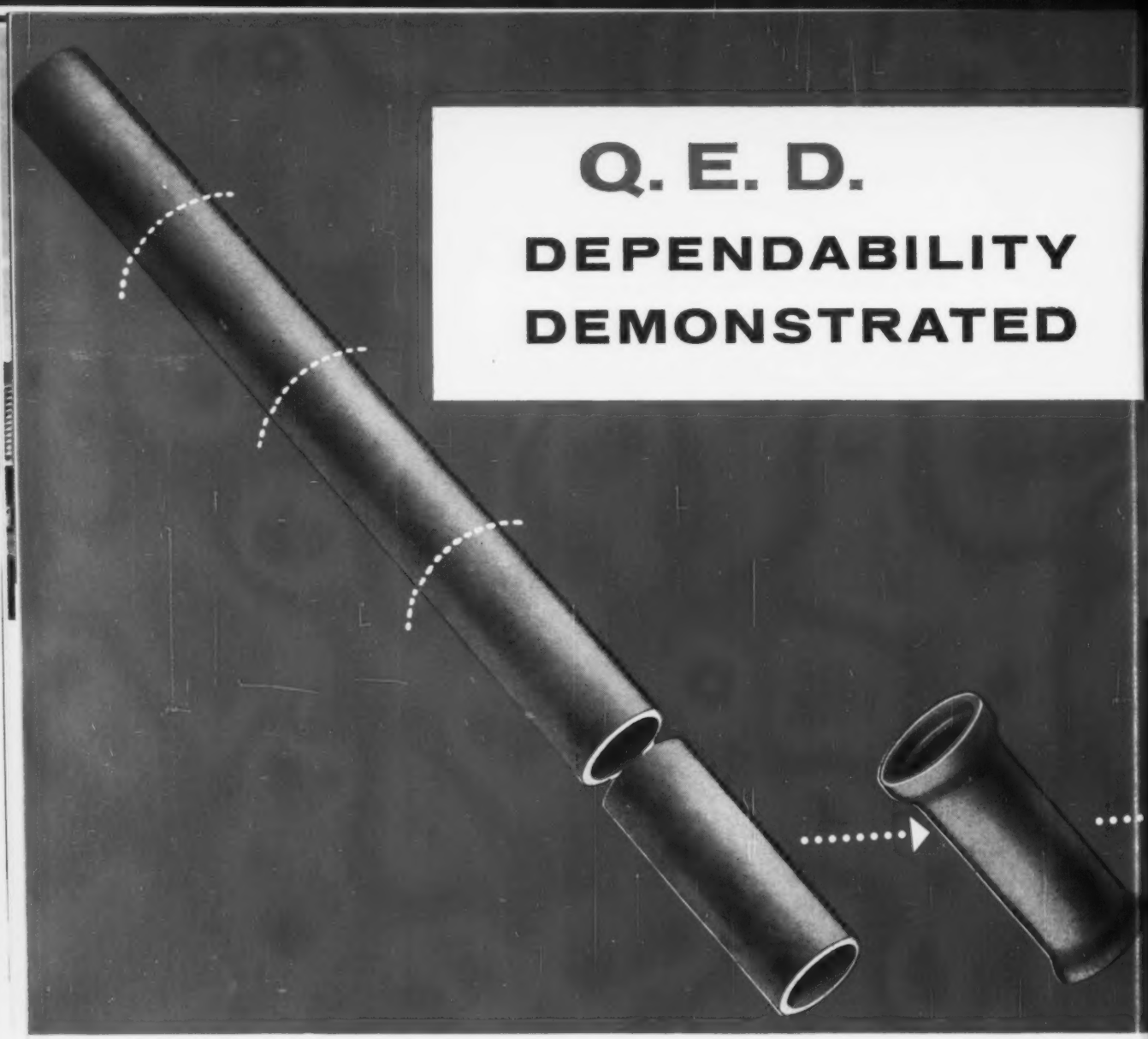


MORE!

"Even in the middle of summer, *everybody's* happy when *this* mercury goes up. It's a General Electric Mercury Lamp . . . and when it goes up in a socket, our lighting level, employee morale and production figures go up, too. But our cost of light drops like a barometer in an approaching storm.

General Electric Mercury Lamps, *at any given time in their life, will outperform other brands the same age.* What's more, they're built to last as long or longer than any other. It figures . . . after all, G. E. is first in mercury . . . just as they are in fluorescent and filament lamps. So, I'll stick with the leader."

General Electric Co., Large Lamp Dept. C-923, Nela Park, Cleveland 12, Ohio



Q. E. D.
DEPENDABILITY DEMONSTRATED

Now... basic characteristics of Metal Mold Centrifugal Casting contribute to the reliability of new Lacrosse Missile

THE ARMY'S LACROSSE MISSILE

U. S. Pipe supplies the barrel nozzle in a Cr-Mo-V low alloy steel analysis, heat treated to the following minimums: 95,000 psi tensile strength, 75,000 psi yield strength, and 10% elongation. This alloy is specifically designed to meet exacting military specifications. Various other analyses in carbon, alloy and stainless steel are produced.

Centrifugal casting, a direct production approach to quality, is now finding new and increasingly useful applications in rocketry and missile engineering.

U. S. Pipe, for example, supplies the alloy steel barrel nozzles for the Army's Lacrosse Missile as semi-finished, partially hot-forged lengths. These production pieces are being supplied to The Martin Company, Orlando, Florida — prime contractor for the Lacrosse, and to Parish Pressed Steel, Reading, Pennsylvania — subcontractor to The Martin Company. The contractors then finish machine them for assembly in the propulsion units.

Centrifugal casting offers ordnance design engineers several outstanding advantages:

1. **Versatility.** Many different alloy and stainless steel analyses, sizes and contours can be produced starting with a hollow billet.

2. **Dependability.** Years of experience in producing metal mold centrifugal castings assures high quality and reproducibility.

3. **Economy.** Maximum utilization of the *right* material produced with a minimum of processing to achieve overall efficiency.

Can these basic qualities meet the requirements and lower the cost of your material needs? Write today and outline your particular problem.

Size Range & Composition Flexibility
Outside Diameter—6" to 60" • Wall Thickness—⅜" and up
Length—Up to 25'
Types of Steel Cast, Carbon, Alloy and Stainless—all standard AISI and ACI grades.

UNITED STATES PIPE & FOUNDRY CO.

Steel and Tubes Division

STEEL & TUBES U.S. PIPE DIVISION

BURLINGTON, NEW JERSEY

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INCREASE WORKER PRODUCTIVITY

MARK SERIES NUMERICAL CONTROLS...

.....standard, job-proved packages now in use on a wide variety of machines

General Electric's Mark series of standard, pre-engineered numerical control packages—with systems for controlling 1 to 5 motions plus machine auxiliary functions — are compiling impressive performance records on scores of machines throughout American industry today.

Machine operation is completely automatic—from punched tape prepared on a standard automatic typewriter. If desired, semi-automatic positioning, useful for prototype work, is obtained with manually set dials on the control station.

Key components of a typical Mark package are a controller, a punched tape reader, operator's control station, servo drives and position-sensing units.

8-TO-1 TIME REDUCTION in press operations is achieved on this 100-ton rotary-turret punch press directed by General Electric numerical control. Rapid positioning of table and turret provides up to 40 punches per minute.

40% AVERAGE TIME REDUCTION for all parts produced on this horizontal boring machine means greater output and better equipment utilization. Lead times are cut by 8-to-1, and non-productive worker time is reduced by more than 60%.

with General Electric numerical control

Boost output of man and machine, reduce in-process inventory

Over the past 7 years, management has seen labor costs increase by 50% with productivity up by only 15%. This profit-cutting gap has accelerated an industry-wide need for production methods such as General Electric numerical control.

Key benefits of G-E numerically controlled machines include increased worker output, increased machine utilization, and reduced in-process inventory in virtually every job.

Manufacturers are now realizing far greater output per man-hour . . . faster "pay-back" rates on machines . . . shorter production cycles . . . and much lower inventory investment—in itself justification for numerical control. Here's an example:

Automatically controlled turret drills are used to produce aircraft-engine accessories at Chandler Evans Corporation, West Hartford, Conn. With numerical control, direct-labor costs have been cut in half! The machine operator—working two machines simultaneously—loads the piece, sets the machine in operation, and all production is performed automatically. But, increased productivity is only part of the story. Scrap losses are virtually eliminated, average lead times are cut by 6-to-1, cutting-tool costs are 1/40th of former production methods, and tool life is increased from 30 to 1300 pieces per tool—all adding up to expected ***annual*** savings of $42,000, more than enough to pay for both machines within two years.

Join with Chandler Evans and hundreds of other manufacturers who are increasing productivity, gaining better product quality, and eliminating tooling cost with G-E numerically controlled machines. See your G-E Apparatus Sales Engineer or machinery builder today. General Electric Co., Specialty Control Dept., Waynesboro, Va. 795-7

Progress Is Our Most Important Product

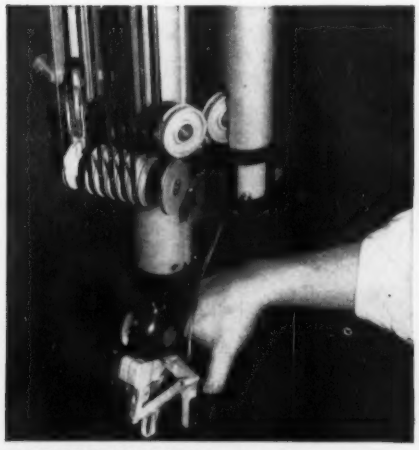
GENERAL ELECTRIC

How NS solved another special steel problem

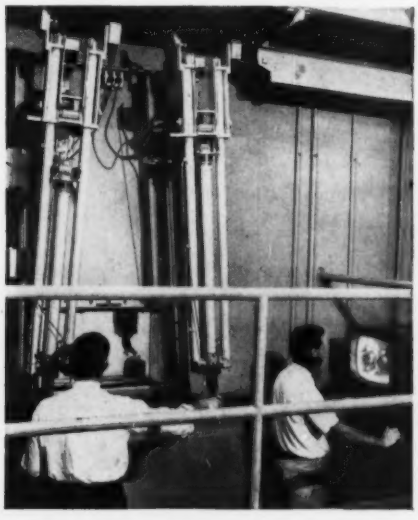
Photos courtesy of Nuclear Systems Division, The Budd Company

RADIOACTIVE MATERIAL is handled remotely by operator from behind three-foot thick lead-glass wall. Nilcor strips, which make quick, accurate system response possible, can be seen running vertically from pulleys just above operator's hands.

SPECIAL NS-ATHENIA STEEL PUTS LIFE IN ATOMIC-AGE ROBOT



HAND MOVEMENTS at operator end of master-slave system are translated without distortion, or time lag through seven Nilcor strips (shown in photo) that travel through 15-foot belt and pulley system.



OPERATOR STATION, shielded by protective wall, has television monitor screen where action inside radioactive room is reproduced as operator manipulates controls of master-slave system.

To manipulate radioactive materials with lifelike dexterity, from the other side of a three-foot thick protective wall, requires robot controls with a high degree of precision and quick response.

Ordinary cable or belt arrangements gave too much stretch between the operator's "master" hand movements and the identical "slave" movement at the other end of the system. Movements had to be translated almost instantaneously and duplicated exactly at the slave end of the system. To help solve this problem, robot system manufacturers came to the Athenia Steel Division of National-Standard to find a strip material that would serve in the belt-and-pulley arrangement of the mechanism with minimum stretch and friction and without backlashing or overshooting.

NATIONAL-STANDARD ENGINEERS at Athenia in Clifton, N. J., recommended Nilcor* strip (basically a cobalt-chromium-nickel alloy) because of its high fatigue resistance, high tensile strength and exceptionally high corrosion resistance—plus less than ⅛-inch lateral sweep per 8-foot length when laying flat without tension. Experiments with .005 Nilcor strip in the robot systems showed an 80% reduction in stretch and 90% reduction in friction over standard wire materials.

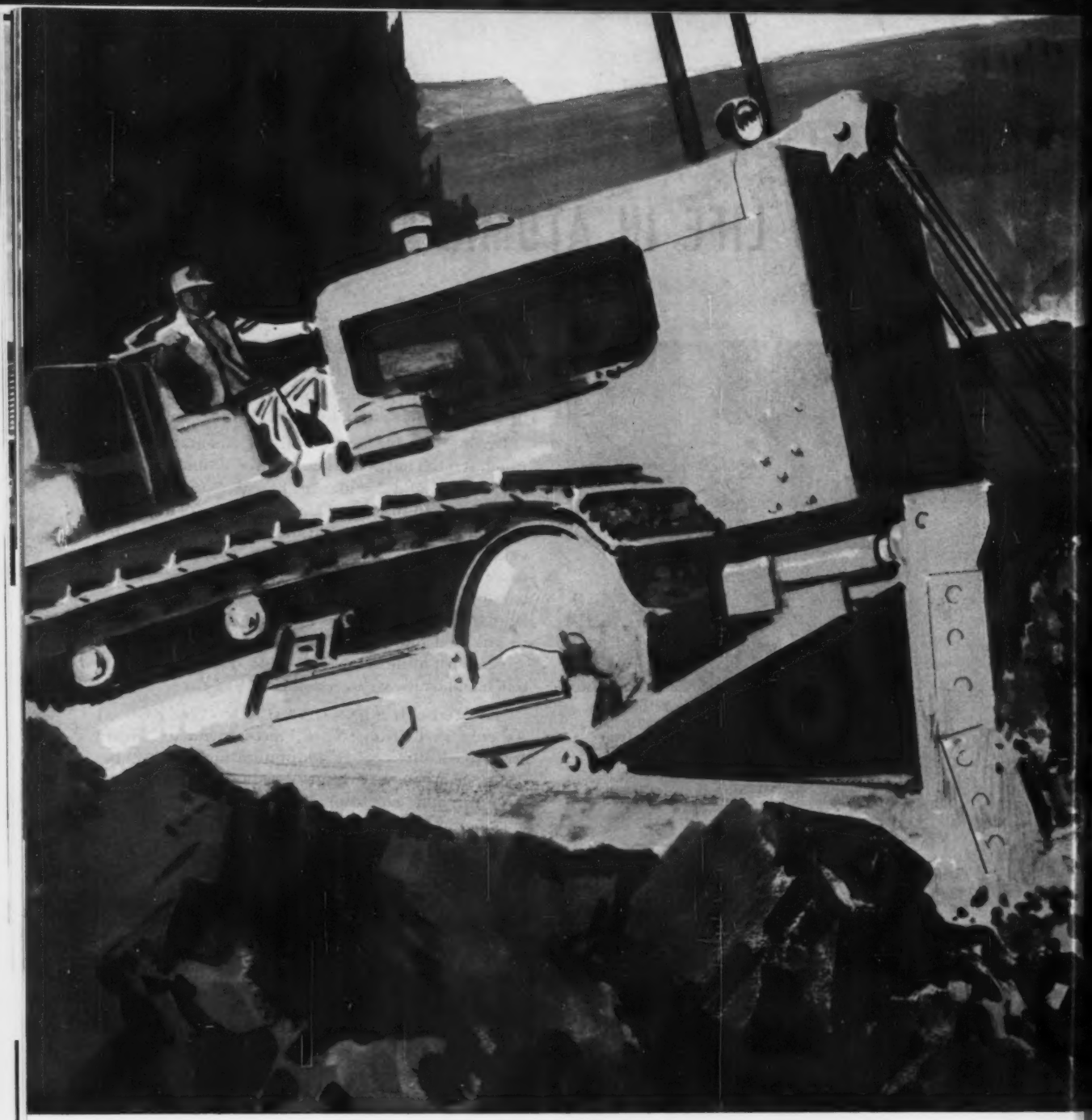
EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire to meet unique applications, is available to *you* from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

*Trade Mark

Manufacturer of Specialty Wire and Metal Products

NATIONAL NS STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY,** Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL,** Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE,** Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS,** Carbondale, Pa.; decorative, commercial, and industrial perforated metals.



Earthmoving muscles from tubes of steel

A construction site springs to life as earthmoving equipment tugs, scoops, heaves and rips away at the earth's skin. It's grueling work!

That burly dozer. It's precision built! It's strong! Its massive blade can tear the side out of a hill. Yet, it's nimble, too. In spite of a crab-like figure, it can stop with a jolt, back off, spin, dig in and charge with the force of a galloping rhinoceros.

Power is jammed into these machines. That's why they're built with the toughest, most durable materials in the world. For years, leading manufacturers have chosen USS Shelby Seamless Mechanical Steel Tubing for hydraulic cylinders, tractor pins, bushings and more than 100 other vital parts in earthmoving, rockmoving, grading

and all types of heavy mobile equipment. *Why?* Because Shelby Seamless Tubing is ideal for the fabrication of machine parts subject to bruising performance and long wear.

USS Shelby Seamless Mechanical Steel Tubing is another product from the world's largest manufacturer of tubular materials. For more than 80 years, National Tube has been foremost in building and industrial pipe applications. For more information, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. *USS and Shelby are registered trademarks*

National Tube Division of United States Steel

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Supply Division • United States Steel Export Company, New York

it will still be as beautiful when she grows up

UNILOY
STAINLESS STEELS

Yes . . . when she's ready to drive her own car, she too will want the long lasting beauty and protective qualities of solid stainless steel trim . . . and if this car is still around, the trim will be just as beautiful as it is today.

For stainless that offers maximum ease of fabrication and lasting, lustrous finish, specify Uniloy Stainless Steel.

UNIVERSAL CYCLOPS
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

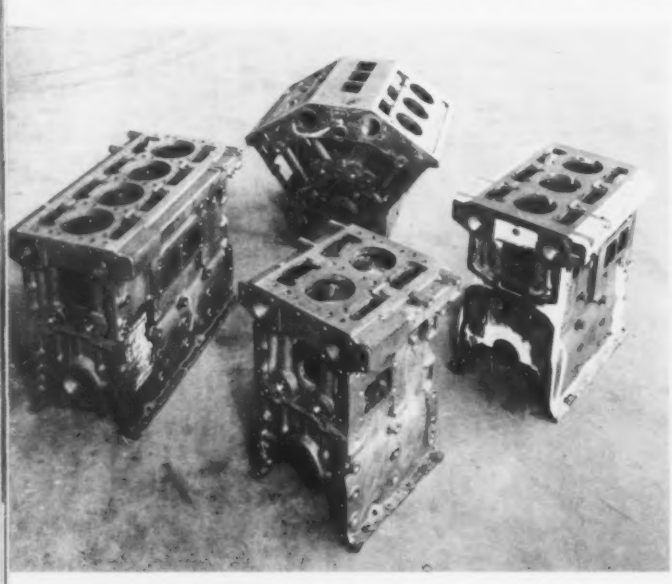
Tomorrow this transfer machine will work on a different part

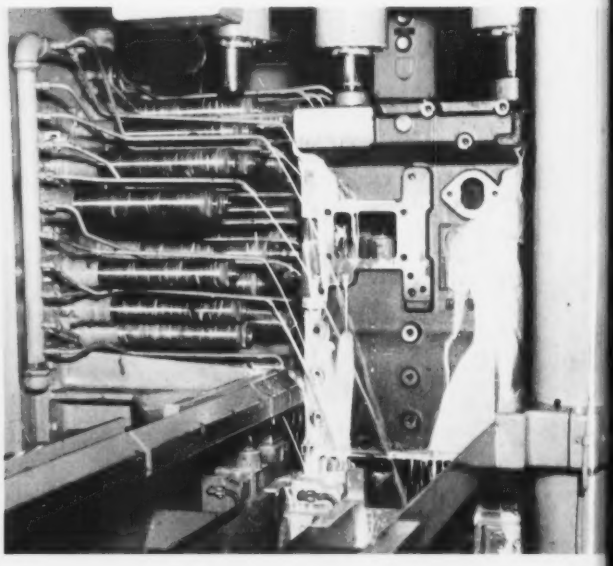
. . . Natco flexible automation can speed your production too.

(see other side)

FOUR PARTS OR ONE CAST IRON OR ALUMINUM

It's all the same to these Natco transfer machines





Look at these four diesel engine blocks. Each is a different machining problem, yet one line of three Natco Holeways does the complete job on them all.

Natco designing skill shows in the easy way these machines accept the four different blocks, either cast iron or aluminum. In only 40 working stations these machines can perform 485 operations. Ingenious transfer devices enable all faces of the workpiece to be machined. Versatile building block construction keeps the line ready for conversion when models change.

Natco Holeway No. 1 is capable of performing 173 different operations—drilling, rough boring, reaming, chamfering and counterboring.

Holeway No. 2 does 139 similar operations, including end milling of these same engine blocks.

Holeway No. 3 performs 173 tapping operations. These machines work on all the external faces of the blocks, including the angular faces of the V-block.

Product mix problems? Think what a truly flexible Natco like this could do for them! Weigh the value of a Natco which accepts a variety of parts and decides what work to do on them. Even if your production won't justify this ultimate in automatic machining—Natco builds drilling, boring, tapping, facing, reaming, chamfering machines in all degrees of automation.

Standard or special, if your machining job is holes, Natco makes the machine to do it better. Let our representative show you. Call him today.

NATCO NATIONAL AUTOMATIC TOOL COMPANY, INC., RICHMOND, IND.

D'Arazien

Alcoa puts the metal where you want it

In less time than it takes you to say "Impact," even the longest of these impacts can be fully formed and flawlessly finished—longitudinal hole, closed end and all—from a single slug of Alcoa® Alloy 6061-T6. Impacts, produced to tolerances as close as plus or minus 0.0005 in. without *any* further processing . . . with smooth, ultra-hard, corrosion-resistant finish 125 microinches both inside and out.

The above pictorially represents the growth of the finished part which, as produced, is approximately 16 in. long: a missile hydraulic component made by Alcoa for Vickers, Incorporated. It represents savings that are scarcely short of fabulous. Estimate for yourself what it would cost to produce such a form by laborious machining from bar stock—the only practical alternative. Include all the labor of rough-cutting, precision machining and final finishing—*and* the costly waste of metal.

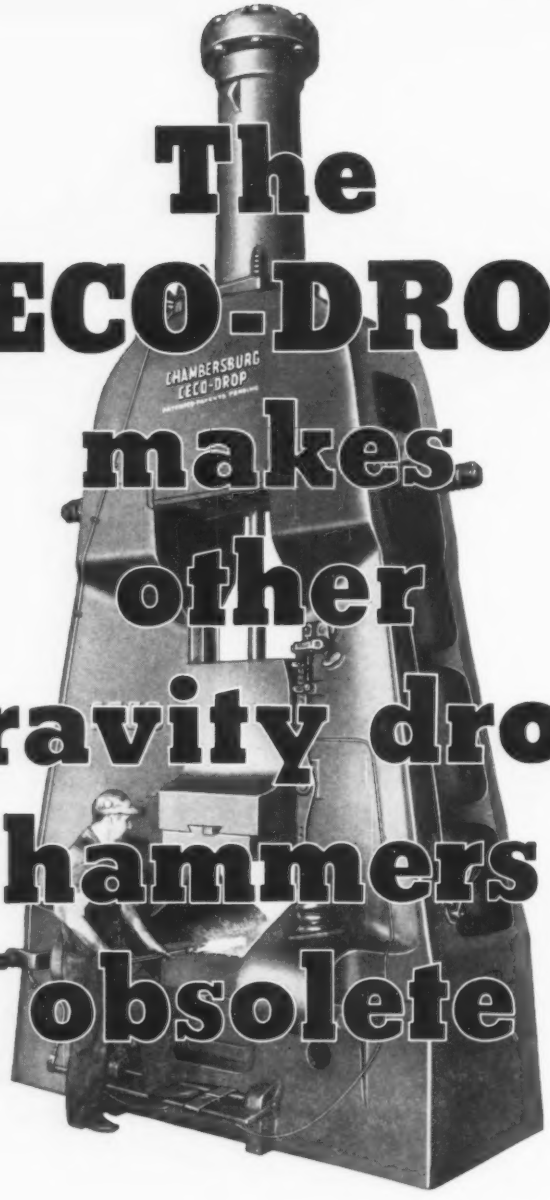
Does this suggest impressive savings? Undoubtedly! But not necessarily more impressive than those you can gain if you consider Alcoa Impacts whenever you need: any closed-end or tubular component, of whatever shape, with such additions as external or internal fins, ribs or bosses . . . and with the highest strength attainable in any given alloy. Separate finishing operations are always reduced to virtually zero, and tooling-up costs are surprisingly low. The more you know about impacts, the more uses—and savings—you'll find in your own production. For eye-opening data, write to: Aluminum Company of America, 918 Alcoa Building, Pittsburgh 19, Pennsylvania.

Alcoa puts the metal where you want it—in castings, forgings, extrusions, screw-machine parts and impacts.

ALCOA ALUMINUM

For Exciting Drama Watch "Alcoa Theatre," Alternate Mondays, NBC-TV, and "Alcoa Presents," Every Tuesday, ABC-TV

The CECO-DROP makes other gravity drop hammers obsolete



THIS is no mere slogan; it is a statement of fact. Since its introduction twelve years ago, the Ceco-Drop, in installation after installation, has proved its greater productive capacity and its economy over any other gravity drop hammer.

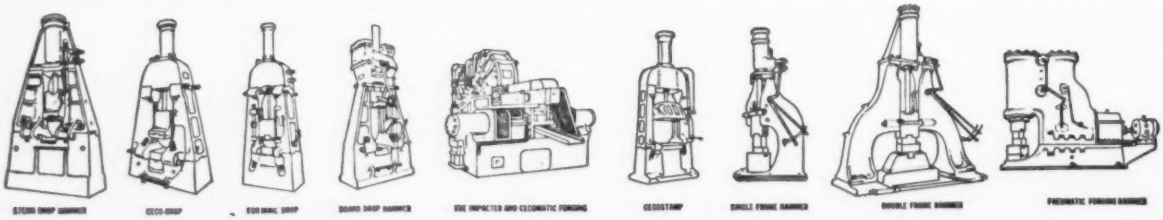
These are not unsupported claims. They are backed up by testimonials from users: like **"increased production over board drop between 10-20%"**; "die life on the Ceco-Drop is nearly double"; **"the first two Ceco-Drops have saved approx. $3000 each** in maintenance and boards in first year"; "after approx. 1200 production hours, one Ceco-Drop had total of less than 10 hours maintenance"; **"I would give a good deal if I had all of our board hammers out of the shop and nothing but Ceco-Drops"**; and hundreds of others.

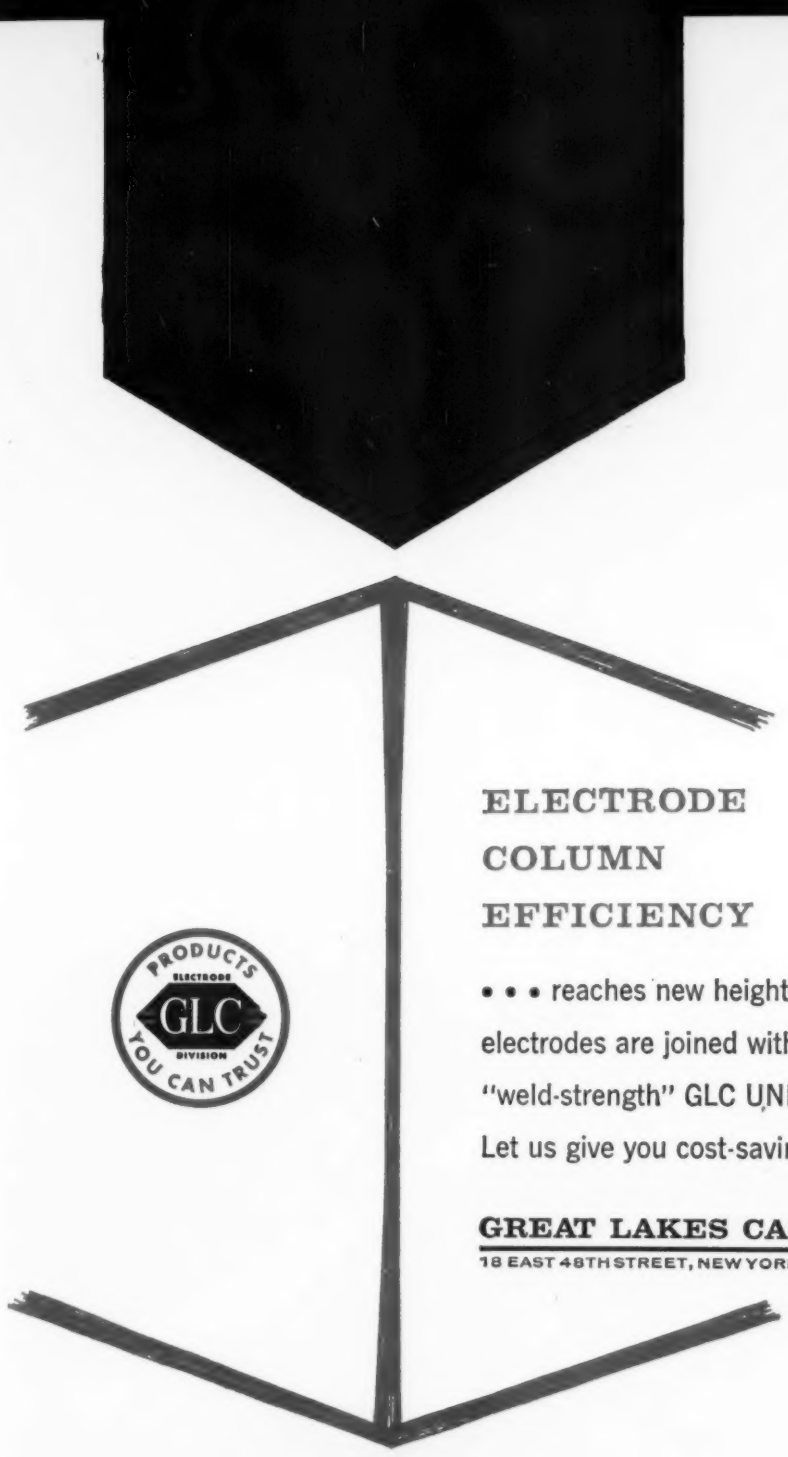
To convince yourself, you should read Chambersburg's 28-page bulletin on Forge Shop Modernization.

Send for your copy today.

CHAMBERSBURG ENGINEERING COMPANY . . . . . CHAMBERSBURG, PENNSYLVANIA

CHAMBERSBURG • The Hammer Builders






The Aluminum Man*..
* Twenty-five years a communicator of new prog-
ress in metals, Joseph C. Barr—salesman fo
Alcoa distributor Williams and Company, Inc.
of Pittsburgh, Pennsylvania—is typical of th
men who make service to industry their caree
. . . through knowledge of aluminum!

He offers a new slant on railing

New installation economy and ease . . . high corrosion resistance and drastically reduced maintenance cost! These are the money-saving advantages of the versatile new railing now offered by your local Alcoa distributor salesman—*The Aluminum Man!*

It's new *Alcoa® Aluminum Adjustable-Type Railing*—the first all-aluminum system of railing and completely machined, compatible fittings ever designed for installation without welding . . . and for perfect maintenance without painting or other periodic touch-up!

Check *The Aluminum Man* now for specific details on *where, how* and *why* this newest Alcoa "product for progress" for business and industry can reduce installation and maintenance expense, provide dependable protection and colorful, attractive appearance for *your* building.

Remember—his advice and the technical aid of the aluminum pioneer that backs him are yours for the asking whether you need a *few* pounds or *thousands* of pounds of *Alcoa Aluminum* . . . the light metal with the bright future that's being seen in more places . . . more and more!

Call *The Aluminum Man.* He's your Alcoa Distributor Salesman for aluminum sheet, tube, shapes, screw machine stock and all Alcoa Mill Products.

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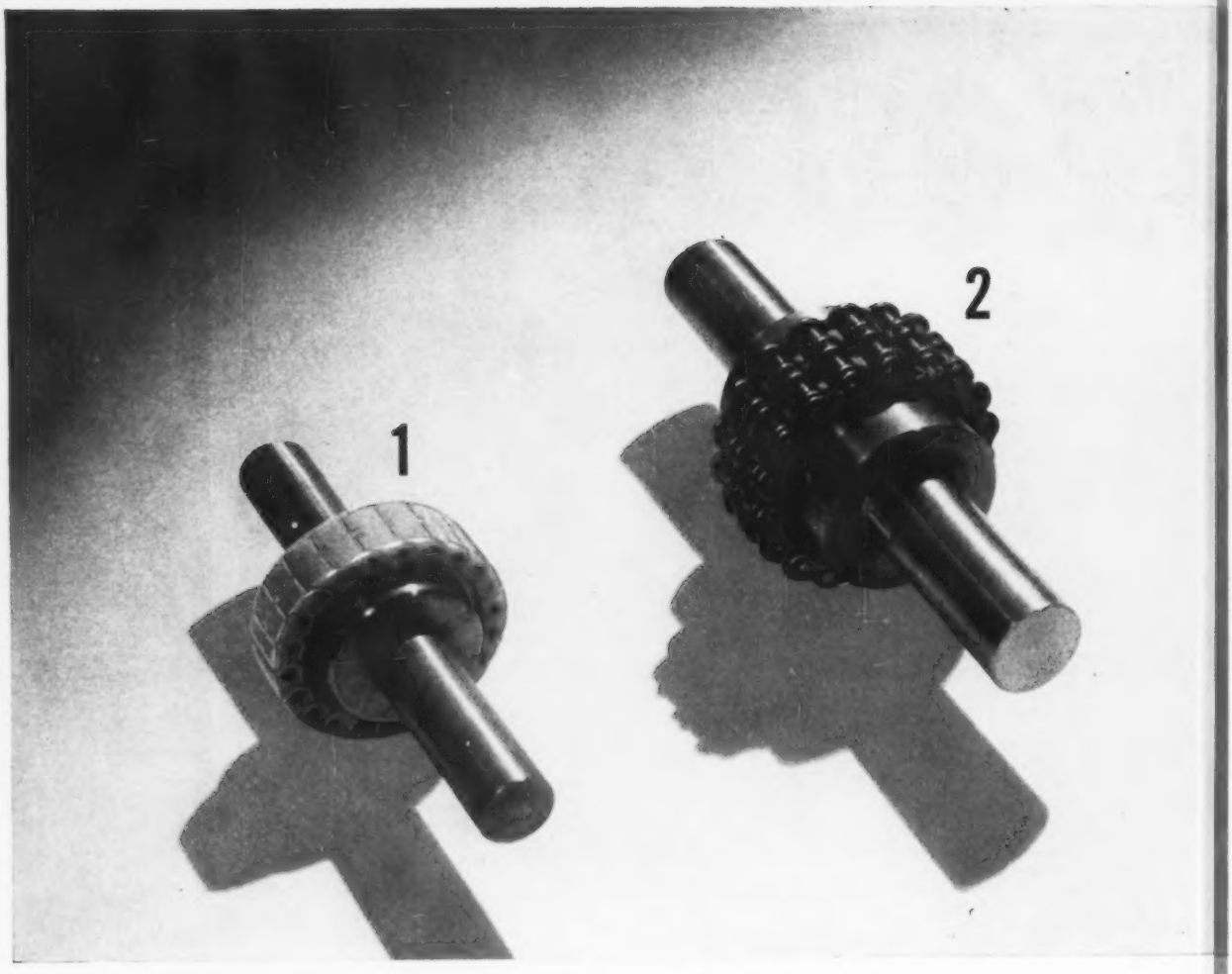


Morse's new Nylon Coupling means:

Nobody can answer your coupling because only Morse offers

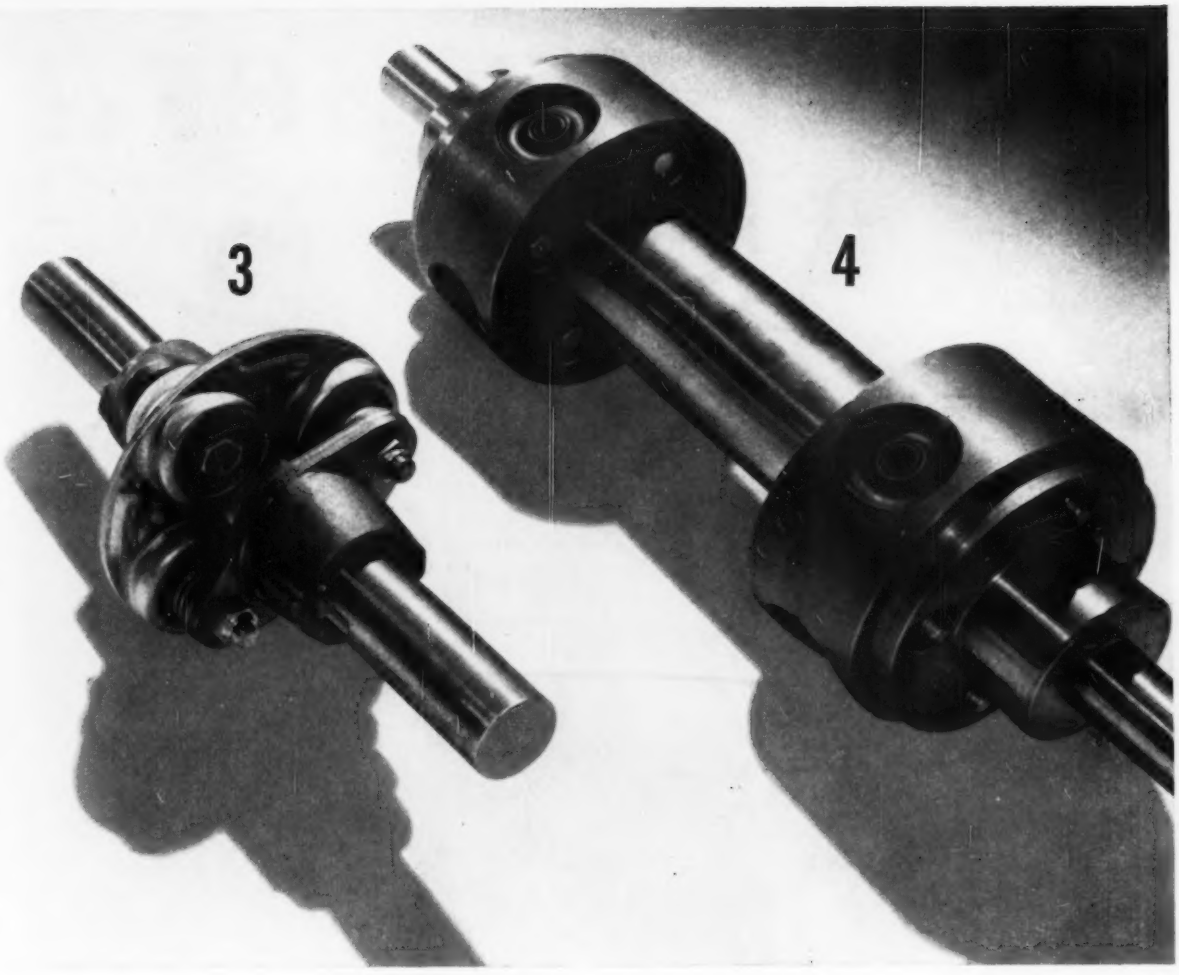
1 New Nylon Couplings:
Cost 20% less than conventional couplings; last indefinitely. Need no lubrication, no cover; take high torque; adjust to misalignment.

2 Flexible Chain Couplings:
For moderate speeds, steady loads. Rugged, economical . . . take higher h.p. per given diameter. Easy to install, align, and disassemble.

3 Morflex Couplings:
Preloaded neoprene biscuit assembly reduces misalignment stresses, increases bearing life; protects machine from shock and vibration.

4 Radial Couplings:
Neoprene biscuits—assembled radially on pins—take heavy thrusts, torques, shocks, frequent load reversals; retain torsional flexibility.

NOTE: All Morse couplings are available in driveshaft constructions.



problems as well as Morse, all four of these flexible couplings

REMEMBER: Nobody gives you a more *impartial* analysis of your power transmission problems than Morse, because *only Morse* offers all four of these basic drives: Roller Chain, Silent Chain, Hy-Vo®, and "Timing"® Belt Drives . . . plus a complete line of power transmission products.

IN POWER TRANSMISSION THE TOUGH JOBS COME TO

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WIRE . . .

PACKAGED for YOUR PRODUCTION

The CF&I Image represents the strength and dependability of all CF&I steel products. And for CF&I Steel Wire, this symbol reflects top quality. CF&I is the leader in designing packaging to reduce our customers' costs.

This is important to you! When you buy CF&I Steel Wire, you cut production costs—save time and money—by specifying the package that works most economically for you. You can choose a CF&I wire package that gives you the following special benefits:

- *reduced downtime through extra long lengths of wire*
- *simplified inventory control*
- *fast, economical in-plant handling*
- *continued cleanliness of the wire*

CF&I Steel Wire is available in a wide variety of gages and finishes. Whatever your wire requirements, be sure to order from CF&I. All orders—from a coil to a carload—will arrive at your plant packaged for your production. Let our nearest sales office know your requirements.

CF&I-WICKWIRE WIRE

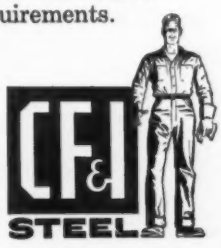
THE COLORADO FUEL AND IRON CORPORATION

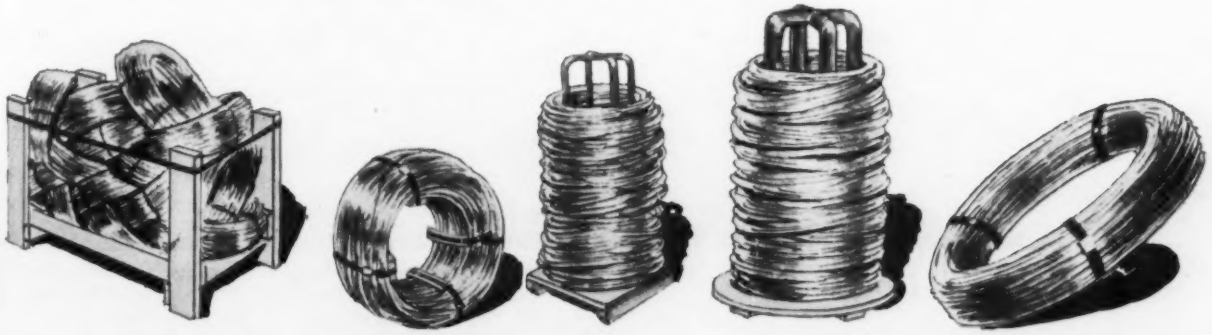
In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans New York • Philadelphia

CF&I OFFICE IN CANADA: Montreal

CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg



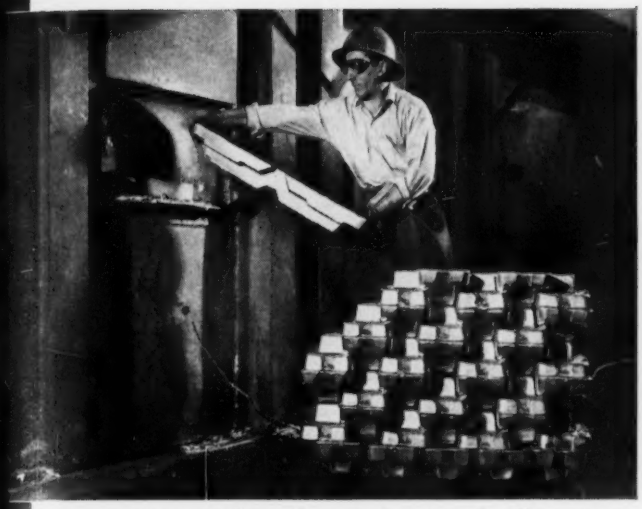


Steel-strapped Wooden Racks | Shaped Coils (1500-2500 lbs. capacity) | Stem-paks (500-700 lbs. capacity) | Returnable Spiders (2000-3000 lbs. capacity) | Steel-strapped Coils (100-600 lbs. capacity)

6626

New handling efficiency. Locking one to another to form stable, rigid loads, new Alcan TRI-LOK ingots give you easier, faster handling with a wide variety of equipment . . . safer, more compact stacking. Save time from car unloading to storage and furnace charging.

Additional distribution (Alcan Foundry Alloys:) **Apex Smelting Co.,** Chicago, Cleveland, Los Angeles • **Charles Batchelder Co., Inc.,** Botsford, Conn.



Free standing. Alcan TRI-LOK ingot bundles maintain their rigidity and stability even when unbanded. This free-standing advantage is a real timesaver in carrying, storing and furnace charging. For Alcan TRI-LOK bundles need no pallets or special slings for pick-up, can be set right on the bare floor . . . safely.

Cuts unloading time. Alcan TRI-LOK bundles take the roughest handling. Interlocking design prevents "rolling" or "fingering" in transit . . . deep grooves keep straps tightly in place. The result: bundles arrive in excellent condition, ready for fast unloading by fork-lift truck. Alcan TRI-LOK bundles save checking time, too. Every bundle is a convenient one-ton, 40-ingot unit.

From Aluminium research . . .

ALCAN TRI-LOK ...a new ingot form especially designed to reduce your handling costs!

From a fabricator standpoint, the new Alcan TRI-LOK ingot may well be the most meaningful advance ever made in aluminum ingot design.

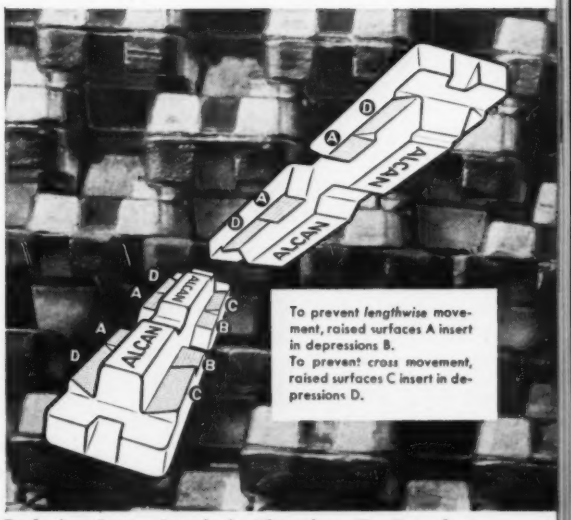
Here's a way to save time in every phase of ingot handling —the new Alcan TRI-LOK ingot!

Newest of Aluminium's ingot developments, Alcan TRI-LOK remelt ingots are especially designed for faster, more efficient handling. You see this handling ease in the safe, stable way the new ingots bundle and stack—locking one to another, not in just one, but in three different ways. The result: measurable cost savings in car unloading, handling and storage operations.

For information on the new Alcan TRI-LOK design—or aluminum in any other ingot form—just call or write your nearest Aluminium Limited sales office.

Aluminium
Limited

Ingot Specialist...serving
American Aluminum Fabricators—



Exclusive 3-way interlock. The Alcan TRI-LOK design is unique in that it prevents lateral movement of any kind. Within the stack or bundle, ingots are "mated" one to another, actually locking in three different ways. Despite excellent stacking stability, there's never an unlocking problem. *Just lift to separate!*

In the U.S.—Aluminium Limited Sales, Inc., 630 Fifth Ave., New York 20, N. Y. CLEVELAND • CHICAGO • LOS ANGELES • DETROIT • ATLANTA

Making fork-lift history!

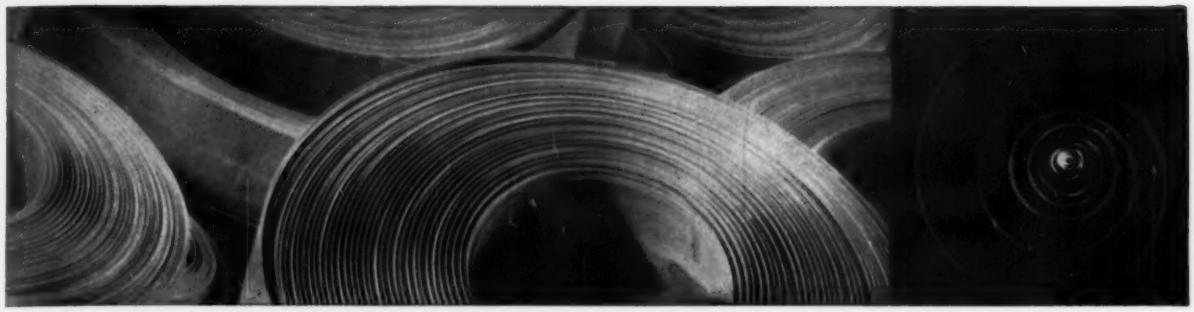
Certified Job Studies continue to report new records of productivity and profit with Towmotor Fork Lift Trucks at work throughout industry. These reports by users show Towmotor handling great varieties of loads in factories, mills, yards, docks and warehouses. Unloading raw materials. Feeding production lines. Storing goods. Preventing platform tie-ups. Loading boxcars and trailers. Saving record amounts of time, space, effort and handling dollars in every industry . . . including *yours*.

These comparative statistics are readily available to you. Ask for *Certified Job Studies* applying to your own business—and *Pace-Maker Booklet SP-23* describing new Towmotor Fork Lift Trucks. Write Towmotor Corporation, Cleveland 10, Ohio.

TOWMOTOR
THE ONE-MAN-GANG

-GERLINGER LEADERS FOR 40 YEARS IN BUILDING FORK LIFT TRUCKS, CARRIERS AND TRACTORS

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation



Check your requirements against these

Wallace Barnes Cold-rolled Specialty Steels

Furnished in these carbon grades:

1.25 – 1.32% .90 – 1.05% .70 – .80% .59 – .74% .48 – .55%

ANNEALED AND HARD-ROLLED

Thickness

.003 – .010″	in widths	1/8	to 6 1/4″
.011 – .014″	“	“	3/16 to 11″
.015 – .019″	“	“	3/16 to 13″
.020 – .035″	“	“	1/4 to 13″
.036 – .049″	in widths	3/8	to 13″
.050 – .064″	“	“	1/2 to 13″
.065 – .093″	“	“	3/4 to 6 1/4″
.093 – .125″	“	“	3/4 to 6 1/4″

HARDENED AND TEMPERED

Scale-free or scaleless; polished*; polished and blued*; polished and strawed*

Thickness

.003 – .004″	in widths	1/8	to 2″
.005 – .007″	“	“	1/8 to 3″
.008 – .009″	“	“	1/8 to 4″
.010 – .014″	“	“	3/16 to 5″
.015 – .019″	“	“	3/16 to 7″
.020 – .025″	“	“	1/4 to 8 1/2″
.026 – .030″	“	“	1/4 to 8″
.031 – .035″	in widths	1/4	to 7″
.036 – .040″	“	“	3/8 to 7″
.041 – .049″	“	“	3/8 to 6″
.050 – .060″	“	“	1/2 to 4″
061 – .064″	“	“	1/2 to 3″
.065 – .093″	“	“	3/4 to 3″

*Maximum width for polishing in .010 – .030 thickness ranges is 5 in.

Facilities for processing alloy steels also are available.

Standard sizes normally available for prompt shipments.

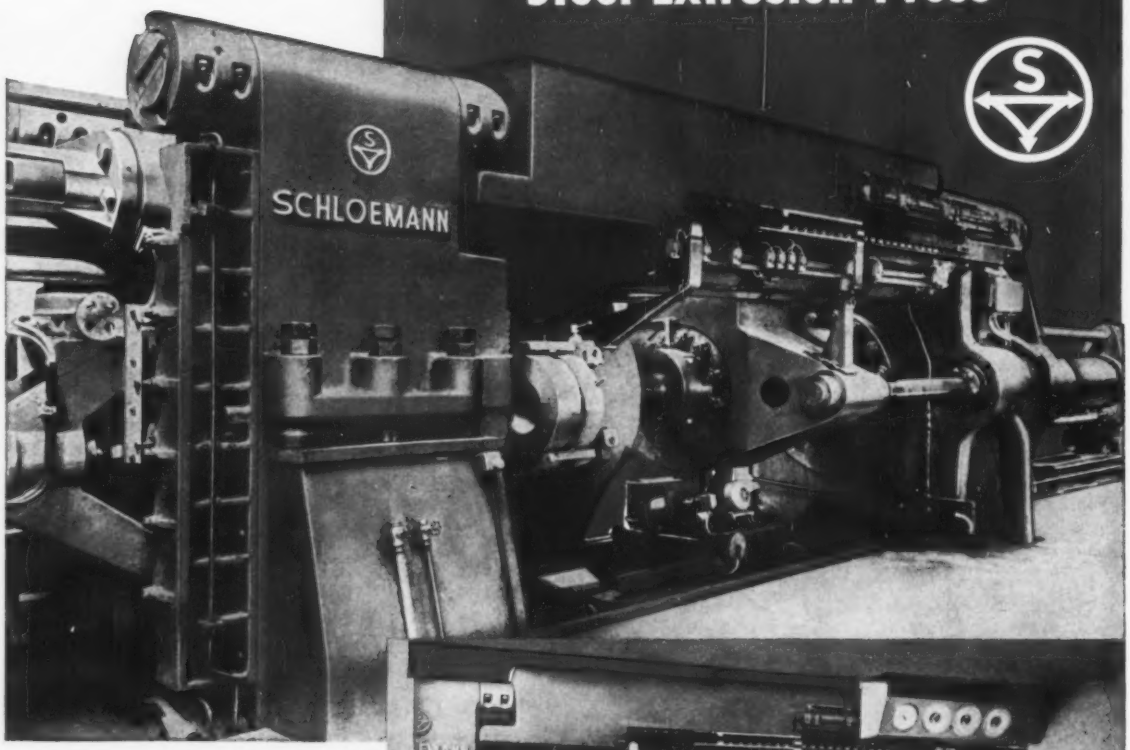
Write for a copy of “Physical Property Charts” that give performance characteristics of .90 – 1.05% and .70 – .80% carbon grades.

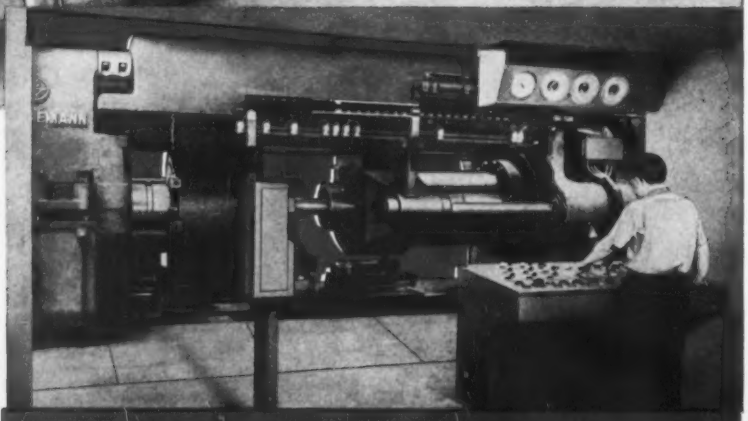
Wallace Barnes Steel Division

Bristol, Connecticut

Associated Spring Corporation

SCHLOEMANN
Steel Extrusion Press





The first to be operated in Germany

The illustrations show essential features of this 2,000 ton press of completely novel design: Overhead guide-ways for moving crosshead and billet container, double swivelling arm for die and butt-end with dummy block. The advantages of these innovations and other features of the press, which, when controlled automatically can attain an hourly production of 10 tons, are described in leaflet 21h/1e.

FELLER ENGINEERING COMPANY 1190 Empire Building, Pittsburgh 22, Pa.

HOT AND COLD ROLLING MILLS • COUNTERBLOW HAMMERS • HYDRAULIC PRESSES

Its balance makes the difference . . .

DOUBLE SIX M-2

HIGH SPEED STEEL

. . . a fully-uniform

DESEGATIZED®

Steel

DOUBLE SIX M-2, now more than ever, is being used for hundreds of applications where its excellent balance of toughness, red hardness and wear resistance pays off in stellar performance of the tools and other products made from it.

Naturally, DESEGATIZED® Double Six M-2 is fully uniform—free of harmful carbide segregation even in the center areas of the bar you buy . . . and it's available in either regular analysis or XL® analysis for improved machinability.

Metalmasters . . .

behind every bar of Latrobe High Speed Steel

- Electrite Double Six M-2*
- Electrite Crusader*
- Electrite Corsair*
- Electrite No. 1*
- Electrite Tatmo*
- Electrite Tatmo V
- Electrite TNW*
- Electrite Dynavan*

**Available in regular analysis or XL® analysis for improved machinability.*

Need better balance of properties for your high speed steel application? Call Latrobe today— ask for Double Six M-2!

Or, send for this booklet . . .

LATROBE STEEL COMPANY

MAIN OFFICE and PLANT: **LATROBE, PENNSYLVANIA**

BRANCH OFFICES and WAREHOUSES:

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One order, one source
. . . every fastener need!

Some things need to be different...

Sound connections are of utmost importance to every project, especially today as requirements become increasingly critical. Many times the unusual is the economical answer. Making the unusual is an important part of our service. And because of our complete facilities and design engineering experience, we usually come up with complete answers.

For operating dependability and efficiency, we might suggest a slight modification of design or material of the part in use. Then again, one of our many standards may better suit your needs. Either way, if you have a particular connection problem—one requiring a low-cost solution, let us see what we can do to help. The services of our specialists are readily available through your Screw and Bolt representative. Contact him today or write us direct. Others do.

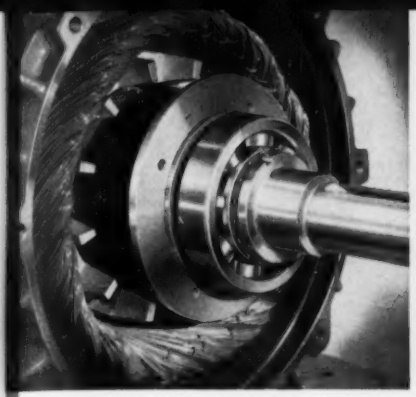
VMA 6732

SCREW AND BOLT CORPORATION OF AMERICA

SERVES THE NATION

Formerly Pittsburgh Screw and Bolt Corporation • P. O. Box 1708 Pittsburgh 30, Pennsylvania

AMERICA'S MOST COMPLETE LINE OF INDUSTRIAL FASTENERS



HEAVY DUTY BALL BEARINGS... The ball bearings used in these motors are of the highest quality, with more than ample capacity to provide long trouble-free service under heavy loads.

BEARINGS CAN BE RELUBRICATED... Original factory lubrication will last for years in normal service—but convenient grease plugs are provided to permit relubrication that adds to motor life under severe conditions.

SECURELY SEALED FOR LOW MAINTENANCE... Both ends of these motors have running shaft seals to keep the bearings clean. Bearing housings are effectively sealed to prevent escape of grease.

Wagner Totally Enclosed Motors

Designed to give you Extra Protection

PROTECTED AGAINST CORROSIVE... ABRASIVE AND EXPLOSIVE ELEMENTS

WM59-7

Here are motors that will deliver full-rated horsepower under the toughest service conditions—that will help you keep your production rates up, and give you the kind of dependable, continuous operation that is so important to automation.

Type EP Motors are fully protected against damage from corrosion, dust, abrasives, fumes, steel chips or filings. Type JP is explosion proof as well—is designed and approved for use in explosive atmospheres.

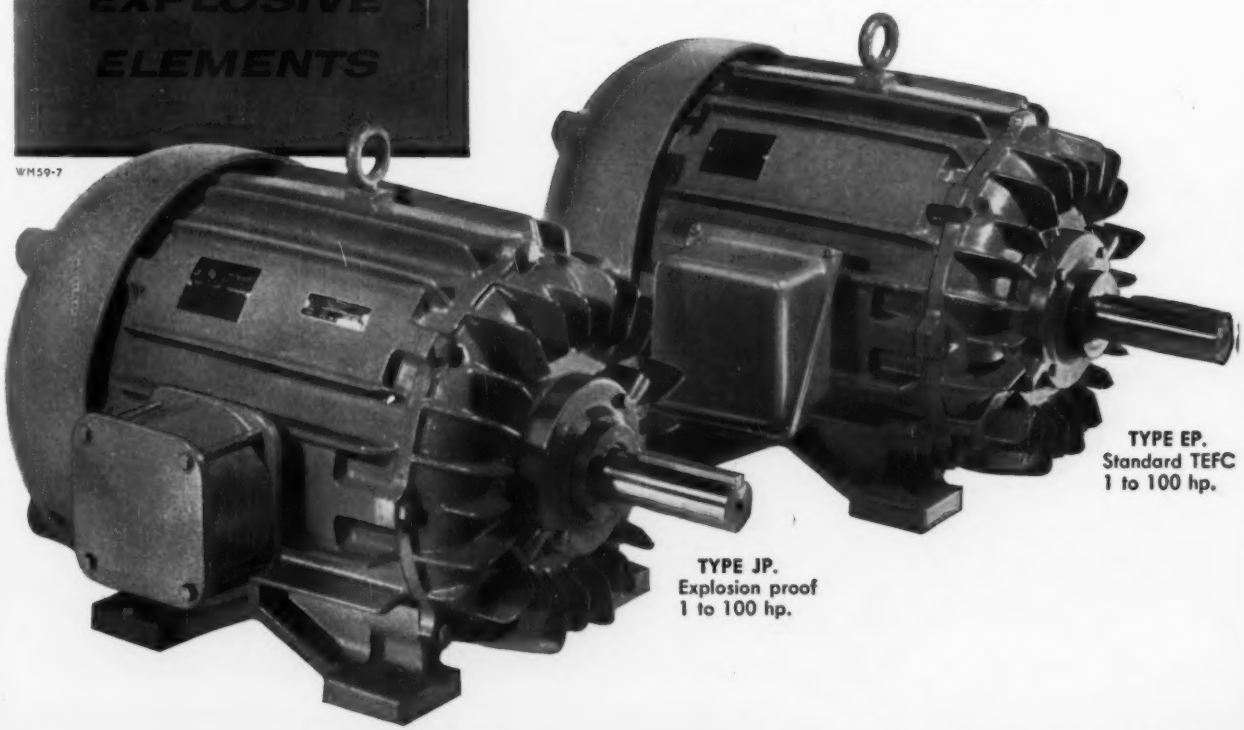
Integral ratings, 1 through 100 horsepower, are built in the latest NEMA frames, 182 through 445 US, with ribs that add mechanical strength and increase the surface cooling area.

Let your Wagner Sales Engineer show you how these protected motors can bring you savings on initial motor costs, maintenance costs, and in continuity of operation.

Branches and Distributors in All Principal Cities

Wagner Electric Corporation

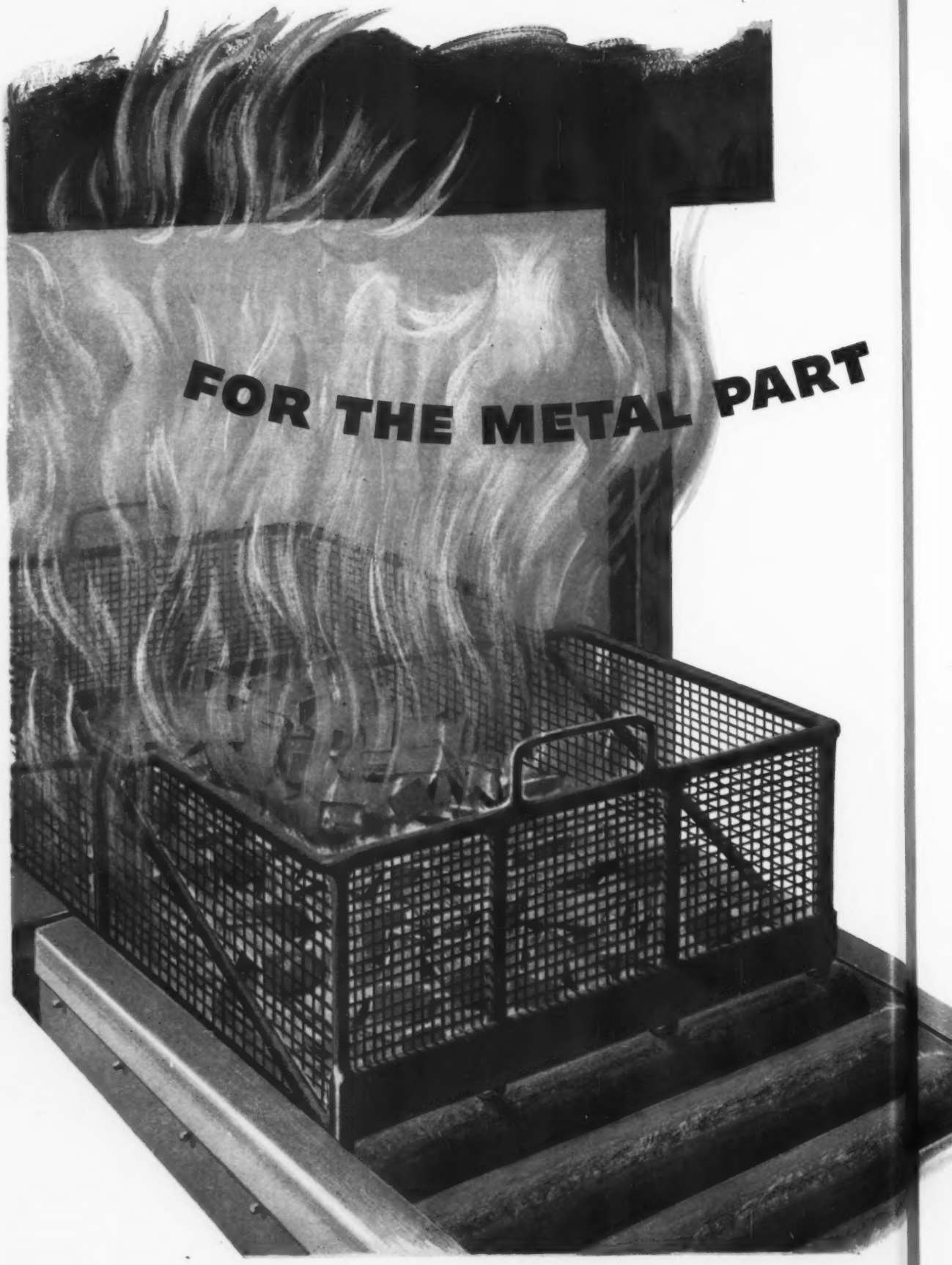
6403 Plymouth Ave. • St. Louis 14, Missouri



TYPE EP.
Standard TEFC
1 to 100 hp.

TYPE JP.
Explosion proof
1 to 100 hp.

OTHER FRAME SIZES AVAILABLE IN RATINGS THROUGH 500 HP.


FOR THE METAL PART

THAT TAKES THE BEATING

Three years' operation at temperatures ranging from 1450 deg. F. to 2040 deg. F.! That's the record of a tray made of HASTELLOY alloy X, used for holding parts in a heat-treating furnace during hardening, gas carburizing, or gas carbonitriding. After the heat-treating cycle, parts are plunged into an oil quench—still in the tough tray.

If you are looking for a metal for machinery parts that have to withstand heat, corrosion, wear—investigate HAYNES alloys. There are more than 15 to choose from, including HAYNES STELLITE cobalt-base alloys, HAYNES iron-base alloys, HAYSTELLITE cast tungsten carbide, and HASTELLOY nickel-base alloys. They are available as castings, forgings, completely fabricated parts, or as sheet and bar stock. All parts can be furnished machined or ground to specified size and finish.

HAYNES Alloys *will do the job!*

HAYNES ALLOYS

HAYNES STELLITE COMPANY

Division of Union Carbide Corporation

Kokomo, Indiana

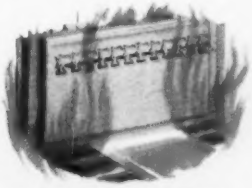
UNION CARBIDE

Address inquiries to Haynes Stellite Company, 420 Lexington Avenue, New York 17, N. Y.

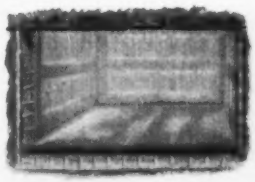
The terms "Haynes," "Haynes Stellite," "Hastelloy," "Haystellite," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

TYPICAL "HAYNES" ALLOY HEAT-RESISTANT PARTS

GRID TRAY of HASTELLOY alloy X holds bits during bonding of diamonds to drill bit face. Furnace heat is 2300 deg. F. in 1½-hour cycles. The trays withstand over 100 such cycles.



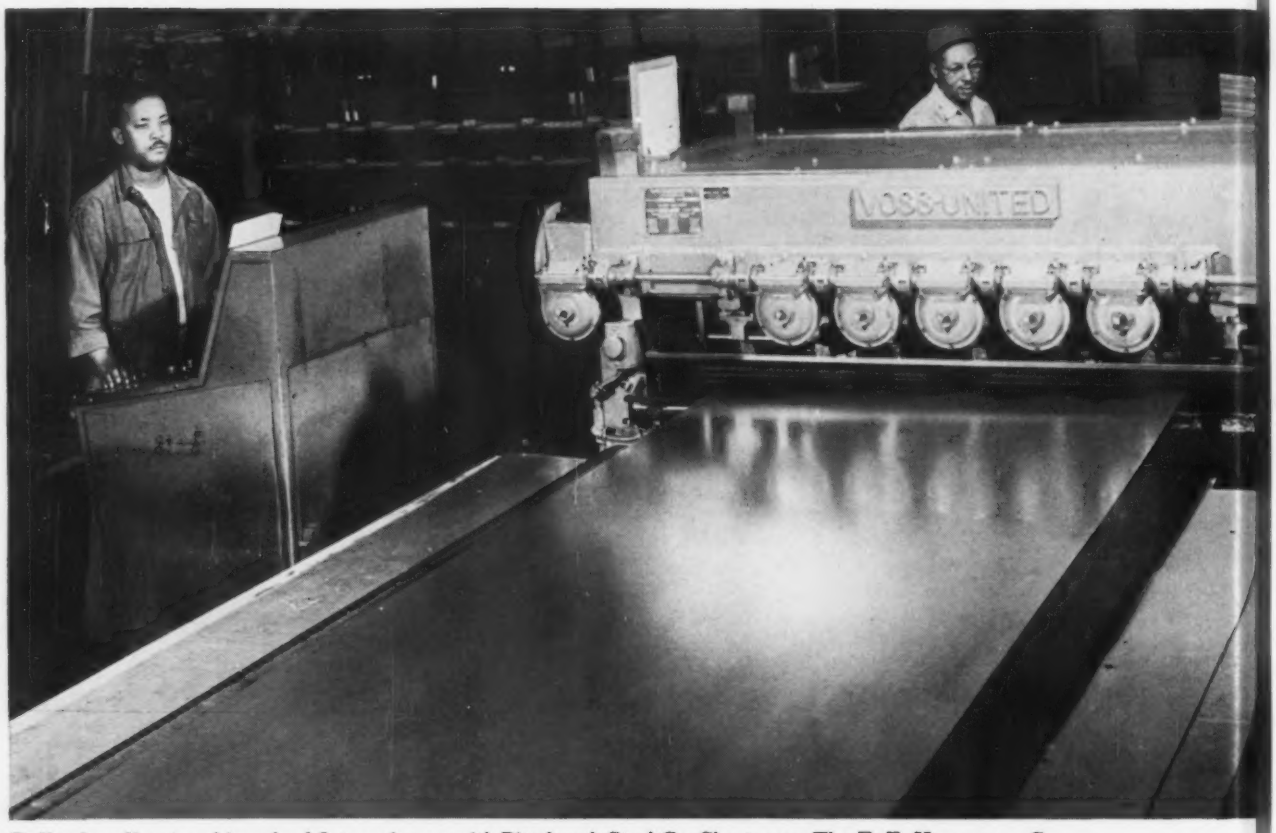
FURNACE DOOR HANGERS of HASTELLOY alloy X, exposed to 2000 deg. F. flames in either oxidizing or reducing atmospheres, have served over a year. Steel failed in three weeks.



HEARTH PLATES and hanger bolts of HASTELLOY alloy X are in their second year of service in electric furnaces that reach 1950 deg. F.—resisting oxidation, thermal shock, heavy loads.

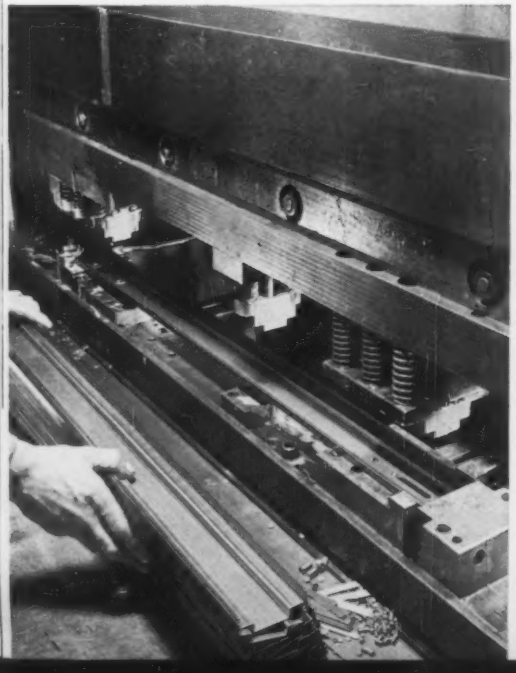
Pittsburgh Steel Sheet Used . . .

Where Flatness Makes Good Steel



Roller leveling to achieve dead flatness is easy with Pittsburgh Steel Co. Sheet, says The E. F. Hauserman Co.

A vertical member, showing sharp corners and severe bends, is embossed and punched on this 500-ton Cincinnati press brake.



Assembly for a flush steel and glass panel is being completed here. Rock wool batting provides sound control and insulation. Note reinforcing ribs on back of panel being placed on "sandwich."

Sandwiches

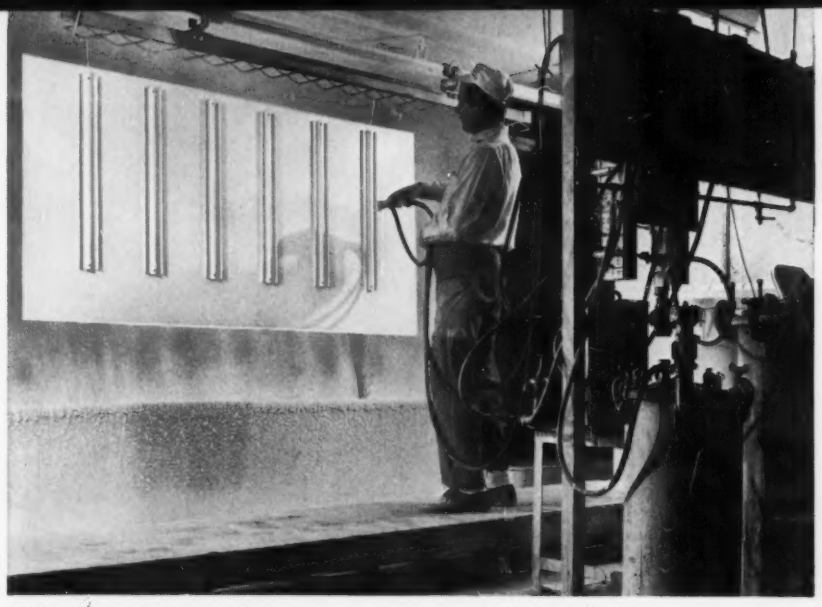
E. F. Hauserman hates ripples . . . The E. F. Hauserman Co., that is.

The Cleveland firm, world's largest producer of movable, interior walls, hates ripples because any kind of ripple in a wall panel is very visible to the eye. The slightest ripple produces a pattern of light and shadow.

To avoid rippling walls, The E. F. Hauserman Co. uses large quantities of cold rolled sheet steel from Pittsburgh Steel Co. because it's easy to achieve dead flatness with Pittsburgh Sheet.

Pittsburgh Steel Co. is one of the leading quality producers of cold rolled sheet steel—the most important raw product in the Cleveland plant. Hauserman must have flat panel plates which can be roller leveled to dead flatness. Sheet provided by Pittsburgh Steel helps achieve dead flatness with a minimum of processing.

The Hauserman company designs, engineers, manufactures and erects movable interior walls for commercial, industrial and institutional buildings on a nation-wide scale. Steel partitions provide greater movability, better appearance, lower maintenance, earlier occupancy, good access for utilities, efficient sound control, fire safety, greater rigidity and low cost through use of economical steel.



Paint line shows partition panel measuring 7 feet by 36 inches getting a primer coat. Good surface of Pittsburgh Steel's sheet shows up here where any flaws would mar paint job.

• **Gage**—Hauserman watches gage very carefully. Their Wean slitter is equipped with an Easterline-Angus electronic recording device which makes a written record of every inch of sheet processed. Pittsburgh Steel meets specifications for gage consistently.

• **Formability**—While flatness is a prime consideration, Hauserman also insists on excellent formability in sheet steel.

A great variety of formed parts, including cornices, inner bases, post caps, bases, spreader channels and reinforcing ribs, are made with severe bends and sharp corners. In some parts a lip of steel is bent back on itself through a 180-degree angle.

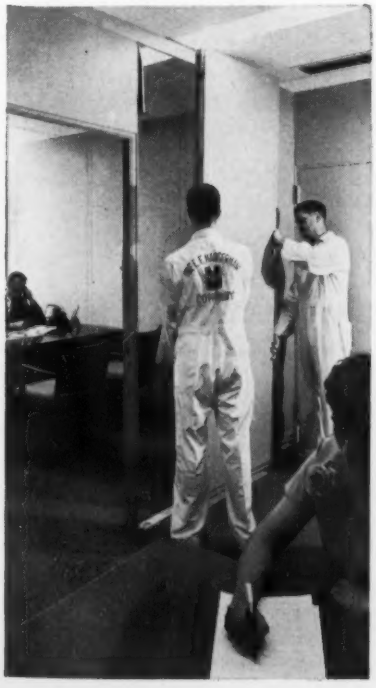
Because cold rolled sheet supplied by Pittsburgh Steel takes these strains without rips or tears, Hauserman has less scrapped material.

• **Surface**—Steel panels get three in-process inspections to make sure surfaces of panels and component parts are free of flaws. Defect-free surfaces make it possible for Hauserman to spray paint with assurance that the paint job won't be marred by flaws showing through.

• **Weldability**—Finally, Hauserman demands good weldability. Component parts and assemblies are fastened by both flash and resistance spot welding. Pittsburgh sheet makes a better product and reduces operating costs by taking a good weld without slowing production.

When a sheet user as exacting as The E. F. Hauserman Co. finds Pittsburgh Steel Co. sheet meets requirements consistently, you and other sheet users can confidently order from Pittsburgh Steel. Whatever your requirements may be—flatness, formability, surface, uniformity in gage, weldability or deep drawing quality—you'll benefit from putting Pittsburgh Steel sheet on your production lines. Trained personnel is available to help with any steel problem. Call a Pittsburgh Steel man today. You'll find him in any of the district offices listed below.

Typical installation of a Hauserman movable wall can be made without chasing occupants out of offices.



Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta	Cleveland	Detroit	Los Angeles	Pittsburgh
Chicago	Dayton	Houston	New York	Tulsa
			Philadelphia	Warren, Ohio

"Our new Bliss makes 16 of these a minute...

...direct from coil stock." Automating bearing cage production was a key objective of the modernization program recently undertaken by The Timken Roller Bearing Company. And close cooperation between Bliss transfer feed specialists and Timken production men resulted in a press that does the work of a number of older ones—it automatically feeds heavy gage coil stock in and finished cages out—sixteen of them every minute. If more parts for less money is your pressing problem then by all means send for our illustrated transfer feed bulletin. It's packed with some unusual applications of the transfer principle. Perhaps there's an idea here for you...

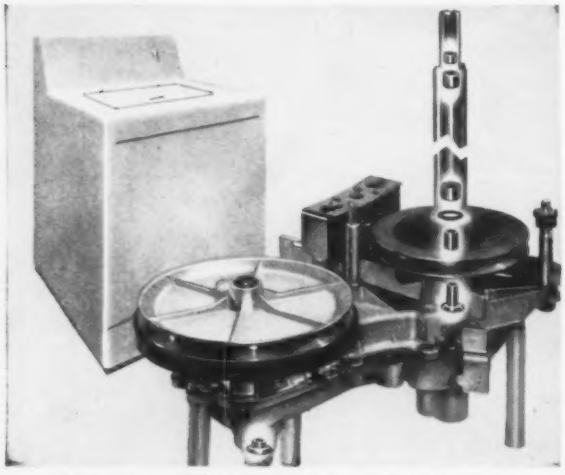
BLISS
SINCE 1857

E. W. BLISS COMPANY · Canton, Ohio

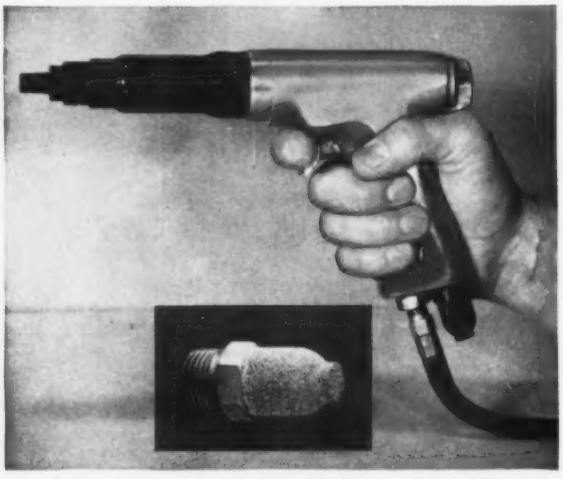
BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

BOOST PRODUCT APPEAL with OILITE



This "best seller" automatic washer is more reliable, more economical with Oilite oil-cushioned bearings.



Oilite filter-diffusers are now boosting the sale of new air tools by making them practically "noiseless".

Dust, grit, shocks — plus payloads up to 34 tons — are all in a day's work for these tough Oilite bearings.

This self-lubricating Oilite bearing refused to fail even after 125 years' service in accelerated life tests.

Quality-built OILITE®* bearings, parts and filters help sell many products by improving performance and keeping costs down. Mass-produced at Amplex's 2 modern plants, even the most intricate parts are die-pressed directly into ready-to-use, close tolerance shapes. Amplex engineering, research and production know-how can probably help you. Why not contact your Oilite representative today? Look for him in the Yellow Pages under "bearings—Oilite" or write Dept. R-6.

** Only Chrysler Makes Oilite*

PM MEMBER

SINCE 1929

A CHRYSLER OILITE PRODUCT

the most trusted name in powder metallurgy!

AMPLEX DIVISION

CHRYSLER CORPORATION, DETROIT 31, MICHIGAN

SELF-LUBRICATING BEARINGS • PRECISION PARTS • METAL FILTERS • FRICTION UNITS

NOW *— from General Electric . . .*

A complete PLUS LINE of low-speed drives 1/8 to 200 hp!

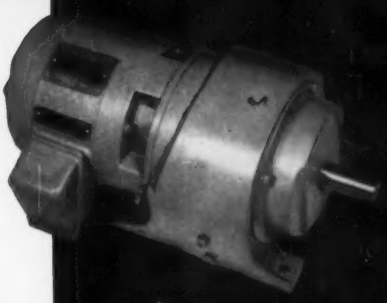
You save time, money when you get all your mechanical power transmission equipment from one source—General Electric!

General Electric now offers a complete PLUS LINE of compact mechanical power transmission equipment in a wide range of ratings to meet all your low-speed drive requirements! All units available on short shipment—many directly from stock!

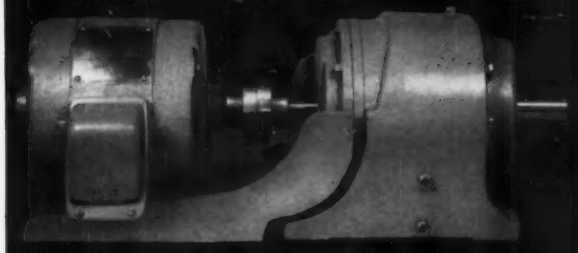
G-E PLUS LINE equipment is easy to install—saves you time . . . requires almost no maintenance—saves you money! Line features shaft-mounted and helical speed reducers; integral-type gear motors in right-angle, offset and concentric-shaft designs and all-motor gear motors of more compact, flexible design to save you space, multiply unit uses.

SHAFT-MOUNTED SPEED REDUCERS—ratios 5:1 and 15:1; ¼ to 40 hp; 420 to 10 rpm.
HELICAL SPEED REDUCERS—1 to 200 hp, with gear ratios from 5:1 to 130:1.
ALL-MOTOR GEAR MOTORS—1 to 75 hp, for output speeds from 520 to 13.5 rpm.
INTEGRAL-TYPE GEAR MOTORS—⅛ to 75 hp for output speeds from 780 to 13.5 rpm.

To put the G-E PLUS LINE to work for you, contact your nearby G.E. Apparatus Sales Office or Distributor, or write for bulletins: G-E Helical Gear Motor Line (GEA-6704), Shaft mounted Speed Reducers (GEA-6616), Fractional Horsepower Gear Motors (GEA-6133A), Section 851–9, General Electric Company, Schenectady, N. Y.



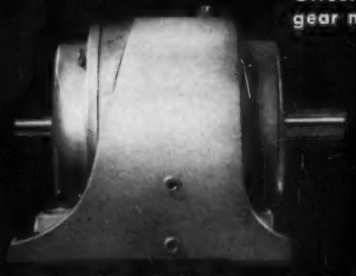
Integral-type gear motor



All-motor gear motor

Right-angle shaft gear motor

Offset-shaft gear motor



New helical speed reducer

New shaft-mounted speed reducer

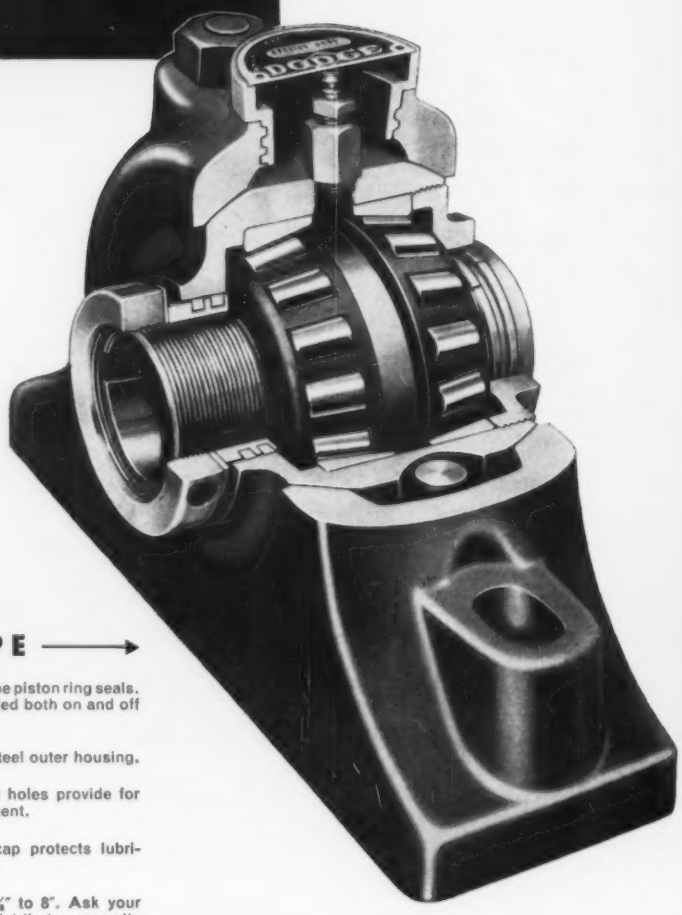
And you get these PLUS VALUES...

1. **Product application service.**
2. **Prompt sales service.**
3. **Expert after-sales service.**
4. **One product source.**
5. **Wide product selection.**
6. **Immediate delivery.**
7. **G-E reputation. Advanced product design through research.**

GENERAL ELECTRIC

DODGE PILLOW BLOCKS
WITH TIMKEN BEARINGS

America's super-quality line—with a 35 year record of keeping performance *up* and costs *down!* Five types—to fit practically any service condition. All assembled, adjusted, lubricated and *sealed* at the factory for precision performance—long life—dependability.



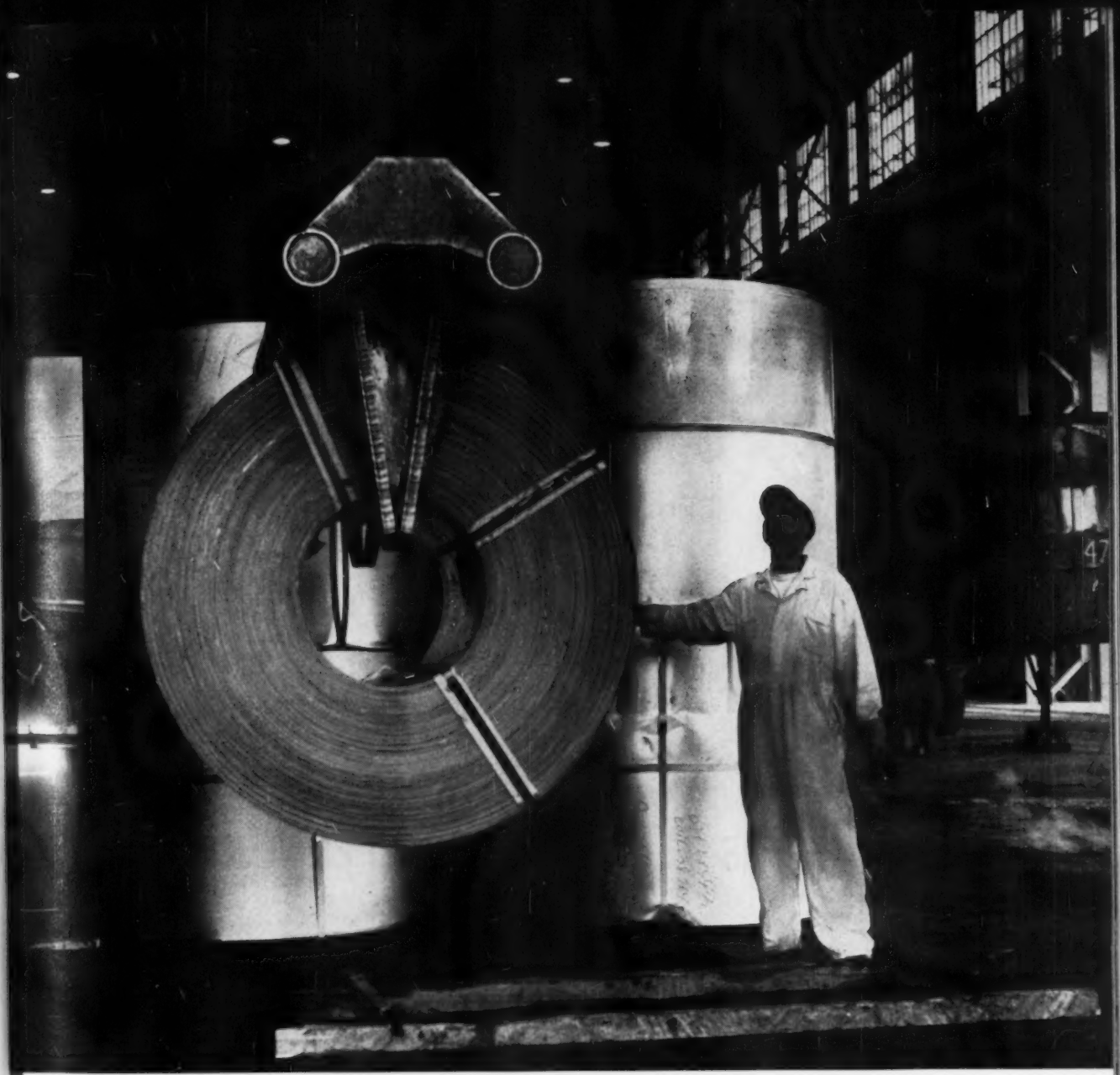
SPECIAL DUTY TYPE →

- Designed for extreme precision and high load capacities.
- Fully self-aligning.
- Special Duplex Timken Roller Bearing with tapered bore.
- Split tapered sleeve with straight cylindrical bore extends through entire length of housing.
- Easy to mount or demount. Adapter nut (or collar) clamps adapter sleeve to shaft with extreme firmness.
- Automotive type piston ring seals. Bearing is sealed both on and off the shaft.
- Rugged semisteel outer housing.
- Elongated bolt holes provide for lateral adjustment.
- Special dust cap protects lubrication fitting.
- Shaft sizes 1¾" to 8". Ask your local Dodge Distributor—or write us for Bulletin A670 giving complete technical data on America's most complete line of mounted bearings.

DODGE MANUFACTURING CORPORATION, 800 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE
of Mishawaka, Ind.



INSTANT STEEL

A CALL TO YOUR LOCAL STEEL DISTRIBUTOR ENDS IN-PLANT SHORTAGES FAST!

Emergency? Your steel service center can end it in a hurry with practically any amount, quality, size or shape of steel you may need. No more in-plant steel shortages—no more plant shutdowns—no more lost contracts.

Or you may choose to use his facilities, stocks and fast delivery service on a regular basis. Whatever your production needs, your local steel distributor is on hand ready to give instant service. All you have to do is phone.

Call him for any quantity of Weirkote continuous-process zinc-coated sheets, Weirzin electrolytic zinc-coated sheets, hot- or cold-rolled sheets or any type of steel you may need for any type of production job.

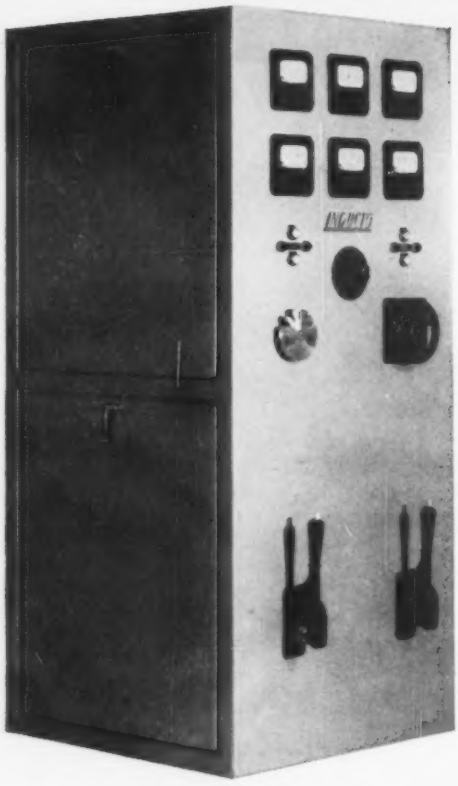
WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

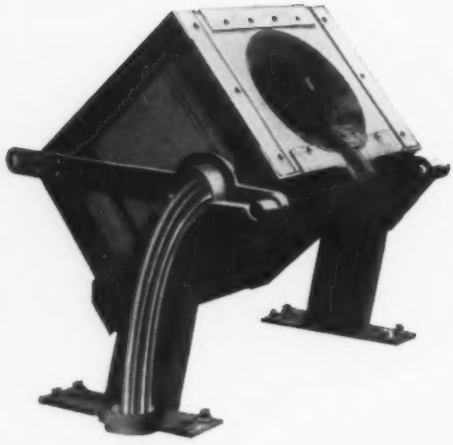
WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION



**INDUCTOMELTING is high-frequency induction melting PLUS the additional advantages of INDUCTO design features and engineering techniques.*



INDUCTOMELTING MEANS* **Savings** IN INSTALLATION AND OPERATING COSTS

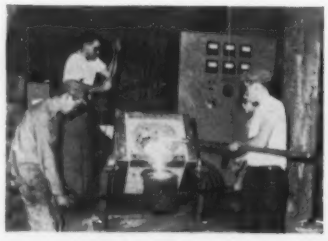
From the moment your INDUCTO equipment is installed, you start saving money. And this saving continues for the life of the equipment.

The reason is simple. Inductotherm engineers have applied the advantages of modern design to the well-established principle of high-frequency induction melting. Take INDUCTO control cabinets, for instance . . . they are surprisingly compact yet they contain all the control, metering equipment, capacitors, transformers and selector switches necessary for the efficient operation of induction furnaces. We ship them completely assembled to keep installation costs at a minimum. Now . . . look at the furnaces. The exclusive INDUCTO power leads enter through the trunnion. No furnace pits are required. There's very little bus bar to buy and install because the runs are short. Installation time is minimized—an additional saving because you are in production faster.

How does INDUCTO equipment operate? Your men will find that it handles easily—effectively. Its high melting speeds and precise temperature control will soon show you how INDUCTO equipment often pays for itself in two to three years of operation.

The features which cut installation costs also contribute to operational savings. For example, the water-cooled furnace leads are specially constructed to handle high-frequency currents easily. Because they enter the furnace through the trunnion, they can be much shorter, thereby reducing electrical losses. The furnace selector switches, designed by Inductotherm engineers, are the most efficient of their kind. They are located on the lower front of the panel to provide a continuous current flow from the capacitors to the furnaces and to eliminate unnecessary bus bar. The high-frequency transformers, built to INDUCTO specifications, have an efficiency rating of 99.5%. In fact, every component reflects our successful efforts to achieve top operating efficiency. It all means better melting—INDUCTOMELTING!

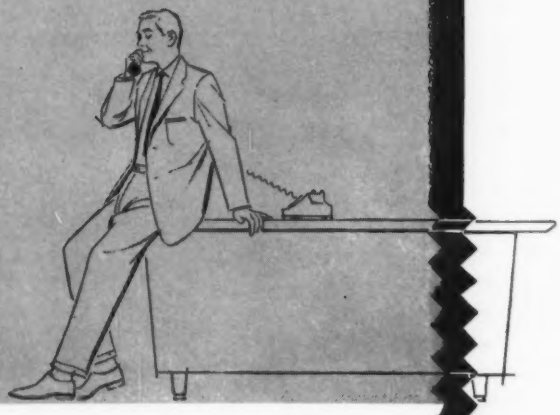
These cost-saving features are detailed in our Bulletin 70 . . . send for your copy today. INDUCTOTHERM CORPORATION, 412 Illinois Ave., Delanco, N. J.



INDUCTOTHERM

. . . the mark of modern melting

HOW YOUR REPUBLIC BOLT AND NUT DISTRIBUTOR CAN HELP YOU...



Cut fastener-inventory costs and confusion

It is as pointless as a wrong-threaded nut to put up with the costs and confusion of unnecessary fastener inventories. Your exact requirements can be delivered to you immediately by your local Republic Bolt and Nut Distributor.

He maintains complete inventories of fasteners of all types and sizes. And he is always prepared to provide quick deliveries—in broken or full lots, in quantities from one bolt . . . to a case . . . to a truckload.

Your local distributor is a qualified expert at maintaining fastener inventories with minimum overhead expense. He is therefore able to meet your needs at much lower costs than would be possible from your own on-hand stocks.

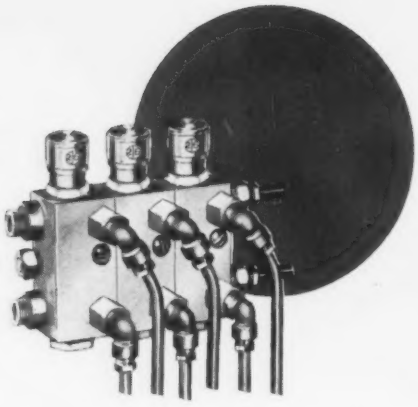
Your local distributor also offers a wide range of other services—complete product information, knowledge of current trends in the fastener industry, and many more.

Get acquainted now with your local Republic Bolt and Nut Distributor. A simple phone call is all that is required.

Call your local distributor for quick deliveries of...

REPUBLIC Bolts and Nuts

REPUBLIC STEEL



Type II Accumatic Valves are fully automatic. Completely sealed for *clean* lubrication of power shovels, cement kilns, conveyors – any indoor or outdoor installation. For all fluid oils and most lighter greases. Available in four sizes to fit a wide range of applications.

ALEMITE

Accumatic®

AUTOMATICALLY LUBRICATES ALL BEARINGS

SAFELY, ACCURATELY, ECONOMICALLY

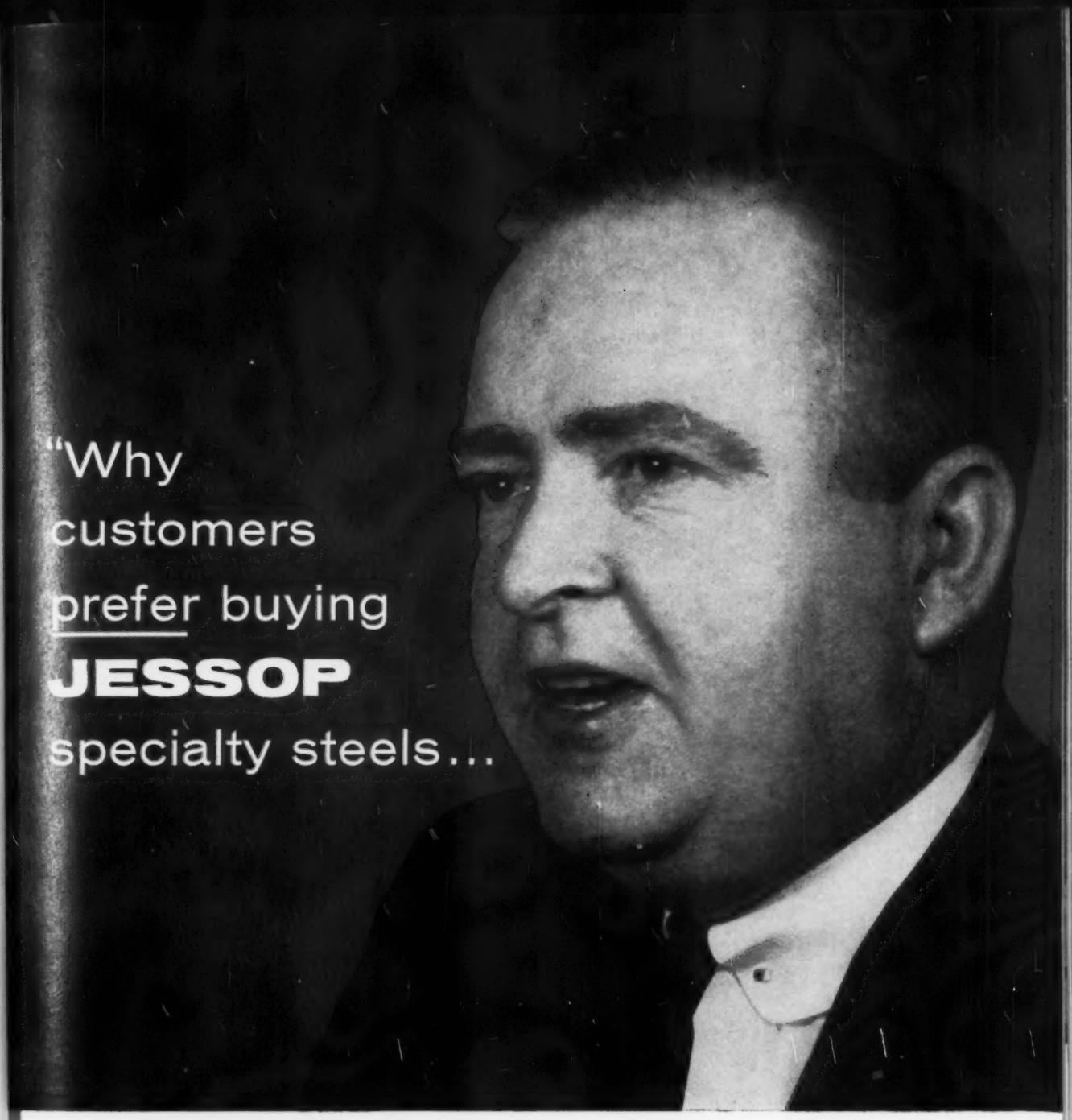
An Accumatic Centralized Lubrication System delivers measured amounts of lubricants at proper intervals, to provide a better lubricant film on all bearing surfaces. Assures completely accurate lubrication, *even while machine is in operation*, with no interruption in production. Reduces lubricant consumption and prolongs service life of each bearing. Machines with many bearings or dangerously located bearings are lubricated from one central point . . . vital high-precision machines receive proper lubrication at all times.

Write for Accumatic catalog today!

Symbol of SW Excellence

ALEMITE
DIVISION
STEWART-WARNER
CORPORATION

Dept. G-69, 1850 Diversey Parkway, Chicago 14, Illinois



"My name is Sam Clokey, vice president-commercial of Jessop Steel, and I've been with this company for 19 years. If I were asked why our customers *prefer* buying Jessop specialty steels, I'd say it's for these same reasons our 61 career salesmen *like* selling Jessop . . .

"Because of the emphasis Jessop places on quality, our salesmen have good reason for confidence in the products they sell, and when it comes to delivery dates and all around service, they know the customer is the 'boss.'

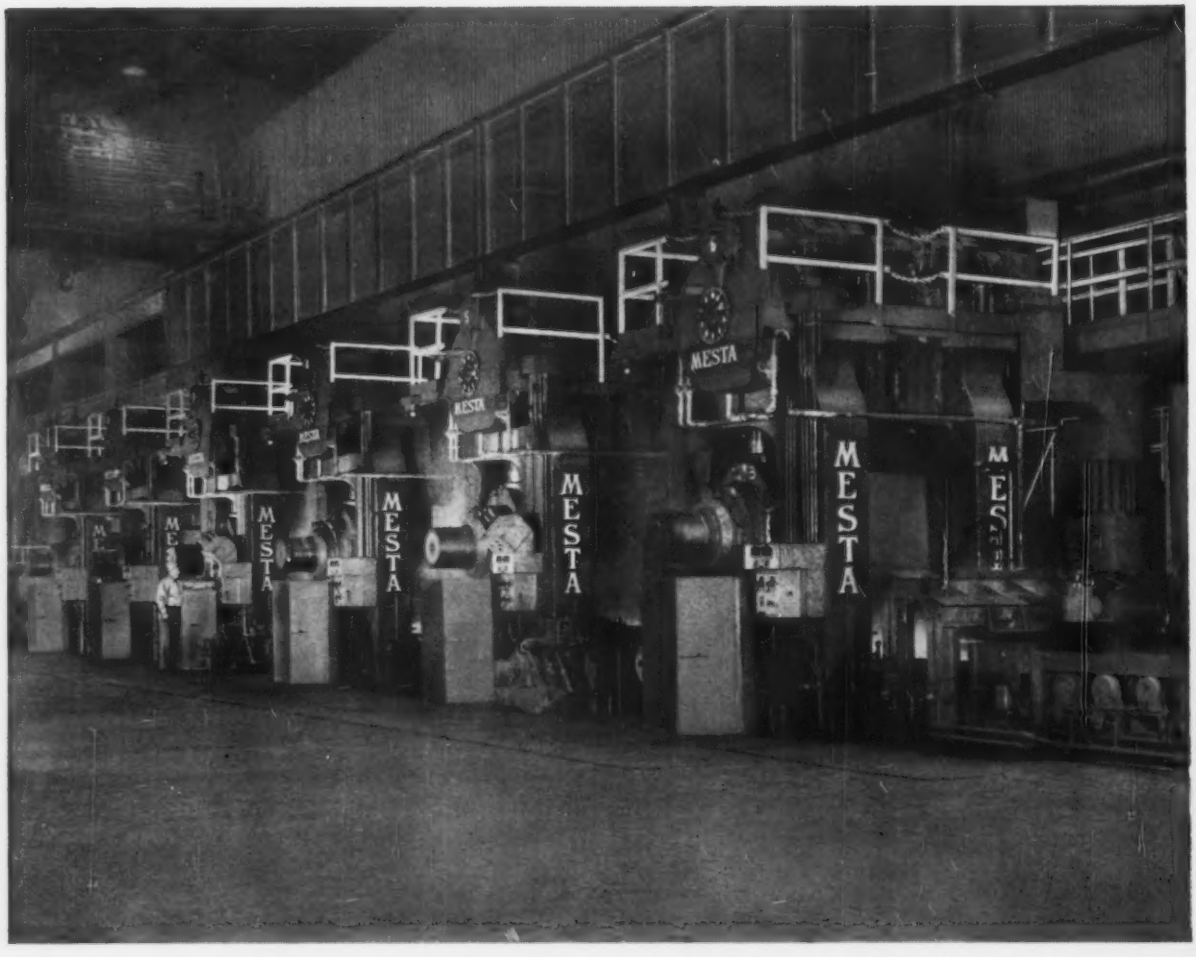
"For these same reasons, Jessop has grown fast . . . from a $4 million operation to one with a potential of better than $60 million. Now we see the same progress at our Green River plant in Kentucky and Steel Warehousing Corporation in Chicago.

"Jessop's growth will continue because this is a fact: When you order from Jessop, you get specialty steels made to your most exacting specifications and you get faster delivery. *Specify Jessop . . . and then relax!*"

VMA 6742

JESSOP
STEEL COMPANY
Washington, Pennsylvania
OFFICES IN PRINCIPAL CITIES

Stainless, alloy, tool, cast-to-shape, and forging steels, precision ground flat stock, and other specialty steels



Ni-Hard double-poured finishing rolls — 12 in all — are used in the 6 hot strip finishing stands at the Jones & Laughlin Steel Corporation, Aliquippa Works, Aliquippa, Penna.

Jones & Laughlin equips hot strip mill with double-poured Ni-Hard working rolls

Finishing rolls of Ni-Hard* nickel-chromium cast iron help produce a lot of strip steel on the 44" Hot Strip Mill at the Jones & Laughlin Aliquippa Works. Twelve double-poured rolls are used, measuring 22½" dia., 44" across the face.

Why Ni-Hard working rolls?

Ni-Hard cast iron possesses, because of its alloy content, a matrix structure similar to heat treated steel. Refined carbides are dispersed throughout this matrix. This is why Ni-Hard cast iron rolls possess considerably greater hardness, strength, and resistance to impact than rolls of unalloyed white cast iron. Abrasion resistance is several times greater.

Ni-Hard rolls have excellent resistance to spalling and fire cracking, too. This is because roll makers modify the Ni-Hard chemistry to produce fine flakes of free graphite which aid in the development of these properties.

Casts much like grey iron

Ni-Hard castings are made with common foundry methods into rolls, ways, and other abrasion and wear resisting mill equipment.

For specific information on Ni-Hard alloy as applied to your abrasion problems, write Inco. For details on these double-poured Ni-Hard rolls, write Inco. *Registered trademark

The International Nickel Company, Inc.

67 Wall Street INCO New York 5, N.Y.

NI-HARD

NICKEL MAKES CASTINGS PERFORM BETTER LONGER

Forming this cup in the traditional manner takes five costly and time-consuming operations.

Precise metal forming simplified

PARISH ingenuity speeds production, cuts cost

The same cup . . . produced by Parish . . . takes only 2 operations through cold extrusion.

Even at its new lower cost, the Parish part is more accurate than those produced by the old-fashioned 5-step forming process. The difference is Parish experience and ingenuity . . . the ability to recognize that there's a simpler, faster, cost-cutting way to turn out high quality production in volume.

Look at the benefits! By streamlining this operation from 5 stages down to 2 . . . with the aid of the latest high-impact presses . . . Parish engineers cut the cost and time for tooling, doubled the rate of production, and delivered the parts at a new low price.

Parish facilities, ingenuity and skill may help you cut the cost of large and small parts requiring stamping, machining, heat-treating, welding, balancing and assembly.

Why not increase your margin of profit by writing Parish today? Your inquiry will receive prompt attention.

● **DANA PRODUCTS:** Transmissions • Universal Joints • Propeller Shafts • Axles • Torque Converters • Gear Boxes • Power Take-offs • Power Take-off Joints • Rail Car Drives • Railway Generator Drives • Stampings • Spicer and Auburn Clutches • Parish Frames • Spicer Frames • Forgings

P **PARISH** PRESSED STEEL

DANA Division of Dana Corporation / Reading, Penna.

imagine for only $179.50 plus F.E.T.

Transcribing accessories at slight extra cost.

a complete electronic "all-in-one" dictating-transcribing machine

DeJUR GRUNDIG

Stenorette®

More than 300,000 now in use. **STENORETTE** carries the label of Underwriters' Laboratories. Your guarantee of the highest safety standards.

The Electronic Stenorette®

—the first really new dictating machine in 18 years!

Dictate, transcribe, erase, correct, start again after an interruption, repeat a word or an entire report, *all with a flick of the convenient "mike" button.* STENORETTE speeds your work, prevents mistakes, saves you valuable hours each day. Here's everything you've always wanted in a dictating machine—*at half the cost of other dictating machines!* It's a fully-equipped, precision business machine that actually *pays for itself* in more-accurate, faster on-the-spot operation!

MORE THAN 300,000 NOW IN USE! Executives everywhere prefer the STENORETTE to any other dictating machine *regardless of price.* STENORETTE gives you all the features of units costing twice as much – plus these advantages: Safety-control automatic error erasure, dual function dictator and transcriber, re-usable tape, and many others you can't get elsewhere at any price. COMPLETELY PORTABLE: weight 11 lbs. 10 oz. Just plug it in—at home, in office, even in a *moving car.* It's always ready when you are. PUSH-BUTTON CONTROL: easiest machine for you—and your secretary too!

® Registered Trade Mark

SEND THIS AIRMAIL CARD TODAY FOR FREE BROCHURE

No postage required. Please send no money.
Turn the page for more exciting details.

DeJUR-AMSCO CORPORATION, Dept. D-921
45-01 Northern Blvd.,
Long Island City 1, N. Y.

Please rush, without obligation, a copy of your FREE BROCHURE explaining how the Stenorette can make my office work go faster, more efficiently, and more accurately.

PLEASE PRINT

Company_____
(If you are interested for personal use, ignore this line)

Address_____

City_____ Zone____ State_____

Individual_____

Title_____

☐ Send me name of nearest Stenorette Sales/Service Center.
☐ Also send me details on the new DeJUR-TRIUMPH Typewriters.

AT LAST!

Push-Button error-free dictation at a price everyone can afford

HOW OFTEN have you seen a *price* in an ad for a complete dictating machine? Probably never. In fact, other manufacturers, realizing that their prices are so high, leave out all mention of purchase price or suggest that you can *rent* their machines. But you can own your Stenorette—because this electronic miracle sells for half the price of comparable major dictating machines. *It even costs less than a standard office typewriter!* That's why every office—even the smallest—can afford a Stenorette.

only **$179.50** plus F.E.T.

Transcribing accessories at slight extra cost.

COSTS LESS...ACTUALLY DOES MORE! Despite its amazingly low price, the world-famous Stenorette does everything the highest-priced units do —and more! It gives you every control, every time-saving convenience you can think of. And, because it's the most modern of all dictating machines, it's the easiest, simplest, fastest of all to use. Imagine! You dictate onto revolutionary magnetic tape—the finest medium for recording the human voice. And you erase with the *automatic* Safety-Control error erasure. Just re-record over the words to be corrected. You can dictate continuously up to 45 minutes. You never have to worry about expensive resurfacing and/or replacement needed for old-fashioned belts, discs, and cylinders. And Stenorette's foolproof PUSH-BUTTON CONTROLS make every step automatic.

FREE BROCHURE SHOWS HOW THE STENORETTE HELPS YOU "TALK" PAPER WORK AWAY.

Illustrated book *tells* and *shows* you how to do more really productive work in less time with the DeJUR Grundig Stenorette®. *Quantities are limited, so get your request into the mail now.*

DICTATE AND TRANSCRIBE WITH ONE MACHINE! A single Stenorette does it all. Just plug in the sensitive "mike" with finger tip Safety Control and dictate. Transcribing accessories designed for convenience and comfort of secretaries are used with same machine.

REALLY PORTABLE...WORKS ANYWHERE! Amazing Stenorette weighs only 11 pounds, 10 ounces, takes no more desk space than your briefcase. Stenorette's special design allows perfect operation in a moving car. (There's no "needle.") Exclusive "Conference" setting lets you record as many voices as you wish. Simple attachment lets you record telephone calls, too.

MOST SENSITIVE DICTATING MICROPHONE. Another Stenorette exclusive. Shout or whisper—hold the microphone wherever you wish. Your voice will play back clearly at its natural level.

USE THE SAME TAPE OVER AND OVER AGAIN! Dictate up to a full 45 minutes on miracle DuPont Mylar® tape. Transcribe. Start again with the same tape if you wish. Stenorette is as economical to *use* as it is to *buy*.

REMOTE-CONTROL ERASER! Make changes without touching the machine. Relax in your chair, press the button on the "mike," listen to your last words —and *record the correct words right over the error*, thanks to safety control erasure.

FOOLPROOF INDEXING! Typist knows exactly where to start listening, where to enter separately recorded changes, etc.

CHOICE OF TRANSCRIBING ACCESSORIES. Double or single earpieces. Playback control with bar on typewriter or pedal under desk.

WORLD'S EASIEST TRANSCRIBING. Tens of thousands of secretaries operated their Stenorettes flawlessly *within five minutes after their first trial.* All agree that Stenorette's clear, restful "playback" permitted rapid, error-free transcription!

**A product of DuPont*

FIRST CLASS
PERMIT #1565
L.I.C., N.Y.

VIA AIR MAIL

BUSINESS REPLY MAIL
No postage stamp necessary if mailed in the United States

postage will be paid by—

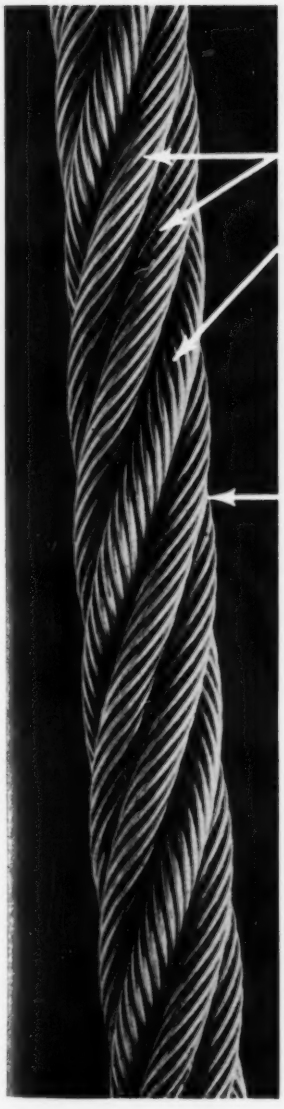
DeJUR-Amsco Corporation
45-01 Northern Blvd.
Long Island City 1, N. Y.

HAVE YOU SEEN THE NEW FULL LINE OF DeJUR TRIUMPH Typewriters

Electric... Standard... Portable

See them at your dealer's now

Mail postage-free card for complete details on the newest, most outstanding line of typewriters *ever*.



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristics.

Heavier outside wires in each strand have greater resistance to abrasion.

"Herringbone* saves our equipment"

AMICO SAND AND GRAVEL COMPANY

Read this about the most exciting wire rope development in years . . . "Turning a profit on any product often boils down to something that will do a specific job better than anything else. Our equipment operators prefer Roebling Herringbone to any other for heavy lifts, clam shell, drag, pan work or dozers. The savings on sheaves, because of Herringbone's perfect tracking, are a big item as far as we are concerned."

Amico Sand and Gravel Company, Morrisville, Pennsylvania, and Riverside, New Jersey, has told you what this combined regular lay and Lang lay rope—two-ropes-in-one—is doing for them. Roebling is in a position to *show* you how the new Herringbone can, again, in the words of Amico ". . . give you a chance to turn more profit on production equipment." Write to Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for the full and fabulous facts.

*Reg. App. For

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Photo courtesy of All-Steel Equipment Inc.

Cutting the cost...of a "mountain" of steel desks!

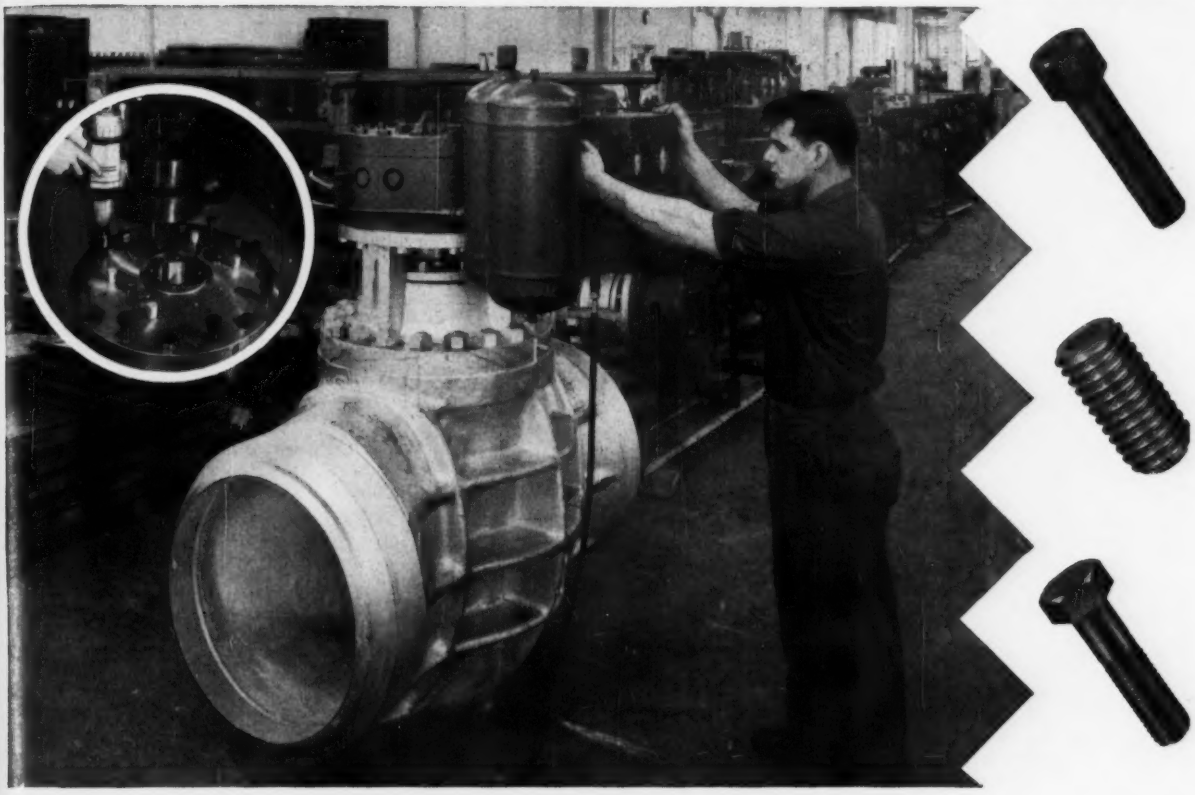
By utilizing a Clark Slender-Arm Clamp, this company was able to eliminate pallets, thereby eliminating unnecessary overhead. In addition, the Clark Engineers consulting this company, recommended use of the new Triple Stage Upright so that extra high stacking could be accomplished *without* sacrificing the lift truck's ability to work in low-overhead rail cars. The end result was much greater storage capacity, one-time handling between warehouse and loading out, a need for fewer trucks.

Your Clark dealer, a Materials Handling Specialist in his own right, has access to the same team of Factory Specialists that developed a "first" in this Company's industry. Regardless of your location, a nearby Clark Dealer is ready to serve you. Call him direct, or write: Materials Handling Specialists, Clark Equipment Company, Battle Creek, Michigan. (Enlargements of the illustration, suitable for framing, are available upon request.)

CLARK® EQUIPMENT

THE I

IT PAYS TO STANDARDIZE ON **STANSCREW**



Stanscrew service adds strength, lowers costs for Shafer Valve Company

The valve operators produced by Shafer Valve Company of Mansfield, Ohio are used to open and close large valves on gas pipe lines . . . often in remote locations, many miles from human supervision. They are subject to sudden surge loads which cause extremely high stresses . . . and their critical importance demands unfailing reliability of all components.

Shafer formerly manufactured their own fasteners for this demanding application from a special high strength steel. Then their distributor arranged for a visit from Stanscrew's fastener specialist. He quickly established that Stanscrew's heat-treated "Carbon Restoration" cap screws, correctly applied, could provide even greater fastener strength . . . and at a significant saving in cost.

The Stanscrew fastener specialist may be able to make similar savings or improvements in your assembly operations. For he brings to your application the experience and facilities which have made Stanscrew a leading supplier of fasteners to the top names in American industry for over 80 years. And he can select money-saving answers to your problems from a complete line of over 5,000 different types and sizes of standard fasteners . . . always in stock, quickly available.

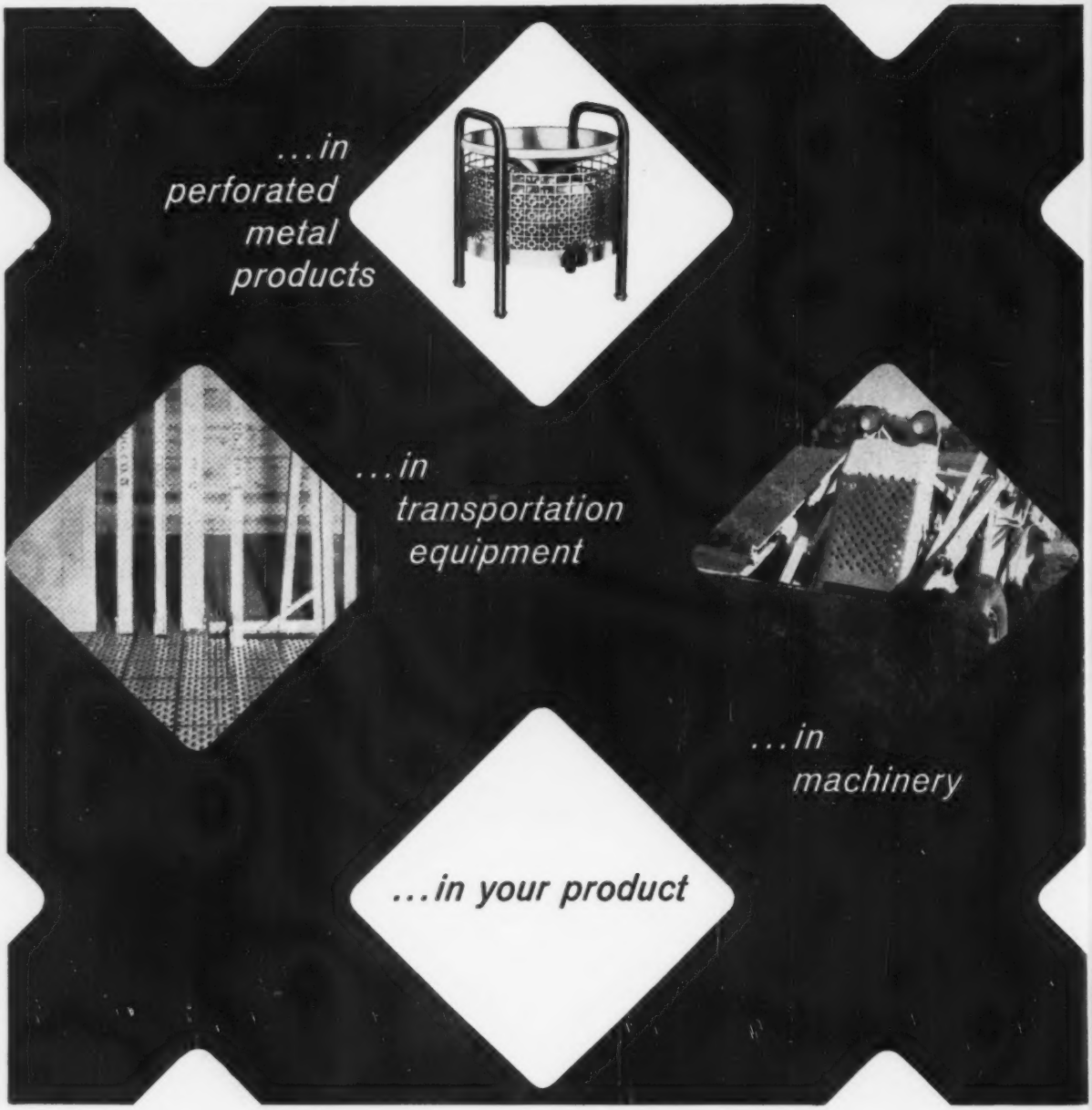
Whatever your fastener requirements, call your nearby Stanscrew distributor today. He will arrange for a prompt visit from the Stanscrew fastener specialist.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

HOW TO PROFIT FROM PERFORATIONS



Hundreds of design applications for Hendrick perforated metals are waiting for *you* to help discover them. When you do, you'll find you can use Hendrick perforated metals for both ornamental and functional purposes—and they'll often cost less to install and last longer than many comparable materials.

Hendrick perforated metals are available in a variety of functional and ornamental patterns, in every available commercially rolled metal. Hendrick also perforates masonite, rubber, plastic, or insulated board. Each can be supplied with varying numbers and sizes of perforations, in plain or panel effects.

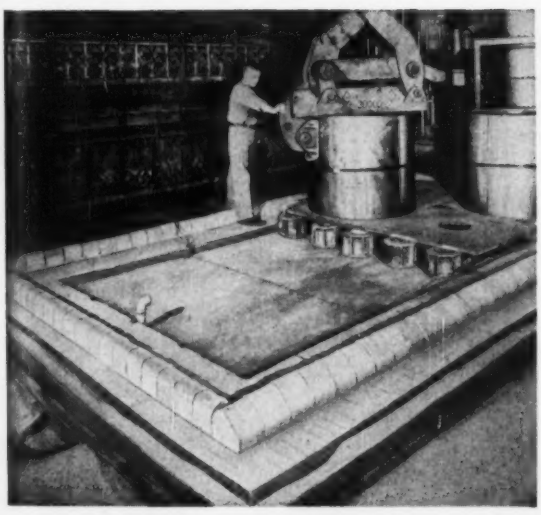
Write for free catalog from Hendrick—the pioneer in perforated metals—and discover other ways of applying perforated metals to your product or equipment designs.

HENDRICK
MANUFACTURING COMPANY
37 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring – Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Four-stack strip annealing furnace with a capacity of three 30,000 lb coils on a 34 to 36 hr firing cycle, 68 to 78 hr cooling, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. The base, 9" thick hearth and portions of the curb are cast of B&W Kaocrete-A.

B&W Kaocrete-A resists CO disintegration and sand penetration at Granite City Steel



B&W Kaocrete-A is cast in the hearths and curbs of these furnaces where firebrick refractory was previously used.

Granite City Steel states that both bases have been in use for over three years without any disintegration resulting from the CO atmosphere. In addition, the monolithic structure of this B&W castable refractory eliminates the destructive effects produced by sand penetrating the joints and cracks of firebrick hearths.

For further information on B&W's specialized refractory castables, write for Bulletin R-35.

Strip annealing furnace with a capacity of 70 to 80 tons per charge on a 24 to 48 hr firing cycle, 48 to 96 hr cooling cycle, operating at a strip temperature of 1320 F in a 8.2% CO atmosphere. 4½" lining of B&W Kaocrete-A is used on hearth and curbs.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W REFRACTORIES PRODUCTS: B&W Alimul Firebrick
B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick
B & W Refractory Castables, Plastics and Mortars
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R-585

How steam treating affects ferrous and non-ferrous metals

Use of steam atmosphere is nothing new to industrial processing but the benefits to be realized from its application in the heat treating of metals have only begun to be explored in the past few years . . . and are currently attracting an increasing amount of attention.

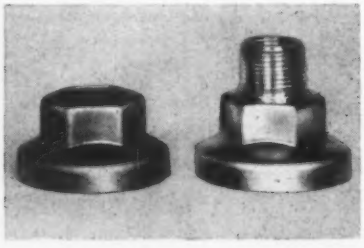
In scores of plants, working with both ferrous and non-ferrous metals, steam treating has proved an outstanding cost-cutter, according to F. L. Spangler, Application Engineer.

These trays of sewing machine parts are loaded for steam treating to give them a uniform, blue-black, wear-resistant finish. Since replacing the previously used bath method, steam treating has resulted in a 90% saving in direct labor and a reject problem has been eliminated.

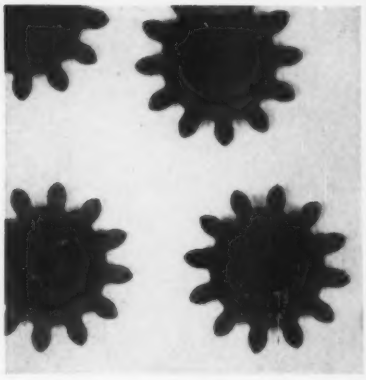
On high-speed steel cutting tools, for instance, it keeps tools sharp longer. Many drills, reamers, hobs, milling cutters, broaches, saws and similar tools hold their cutting edges 50 to 100% longer when steam treated after tempering and final grinding. This ratio goes up . . . often as high as 6 to 1 . . . when cutting such extra tough materials as alloyed structural steels.

On powdered iron parts, compressive strength and hardness increase appreciably. Tests of steam treated sintered compacts indicate that yield point under compression is twice that of a regular sintered compact.

To structural steel steam treating gives a uniform, corrosion-resistant, blue-black finish. When steam treating replaces chemical surface treatment, costs are usually 20 to 25%



These brass radiator steam-vent shells require nine draws and four anneals. Prior to use of a steam Homo furnace, a pickle was necessary after each anneal and a heavy pickle and buffing before final chrome plating. With steam treating the manufacturer has been able to eliminate all pickling . . . now uses only a bright dip and has substantially cut buffing time.



Powdered iron gears measuring 1⅛" in diameter were tested for hardness on a standard Rockwell machine, before and after steam treatment. After steam treating, ten parts tested showed an average increase in hardness of 43% on the gear teeth . . . 112% on gear hubs . . . and a 26% increase in compressive breaking load.

less . . . where it is used for stress relieving or tempering prior to machining or grinding, a shot or sand blasting operation can be eliminated.

On gray iron castings steam seals microscopic porosity, improves resistance to wear and gives a high degree of corrosion resistance. Salt spray tests indicate that parts so treated stand up as well or better than cadmium plated ones.

Applied to non-ferrous metals . . . brasses, bronzes, beryllium copper, aluminum, etc. . . . it produces scale-free work ready for bright dip or use as-is. Within the past few years many manufacturers have substantially reduced and in some cases eliminated cleaning operations by stress-relieving, drawing, solution-treating or age-hardening in a steam atmosphere instead of air.

The equipment for this highly versatile heat treating method is safe and inexpensive... is ideal for installation directly in production lines.

A new 24 page catalog, *The Homo Method of Steam Atmosphere Heat Treating, gives details about application of the method to a variety of parts and materials. These specific instances may suggest ways in which this unique method can go to work for you to improve product quality . . . eliminate needless operations . . . reduce costs. Just write to Leeds and Northrup Company, 4956 Stenton Avenue, Philadelphia 44, Pennsylvania and ask for Catalog TD2-620(1).*

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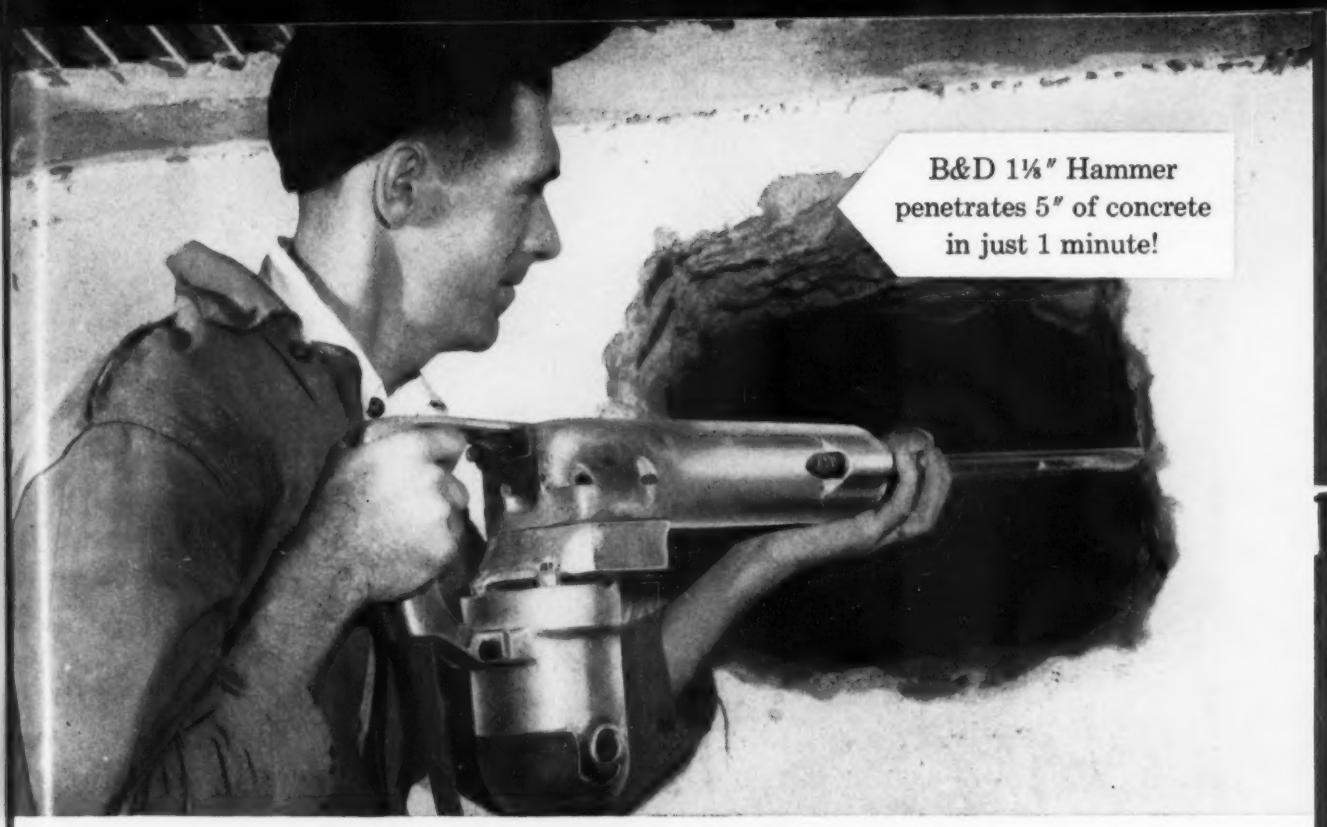
Instruments — Automatic Controls • Furnaces



11 times as much material removed 13 times faster than by hand!

Give your job a finished look with a Black & Decker Bushing Tool.

For the finest, and fastest work always specify genuine Black & Decker forged hammer tools.

Trenches for conduit are a cinch with a Black & Decker Cold Chisel.

Look for Swifty Service at one of B&D's 48 Factory Service Branches. There's one near you.

B&D 1⅛" Hammer drastically cuts cut-through time—labor costs!

Add a Black & Decker 1⅛" Hammer to your tool kit and watch how quickly it opens up your profit margin! It punches through concrete walls in minutes—opens the way for pipe and duct in a fraction of the time it takes by hand.

Plugs into any convenient outlet—the Black & Decker Electric Hammer takes on chipping, gouging, digging, caulking, pointing, and many other jobs! Mail coupon today for a free demonstration on your job-site! If additional information is desired just check the box.

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☐ Please arrange a demonstration of your 1⅛" Hammer.
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for strength, corrosion resistance and high finish

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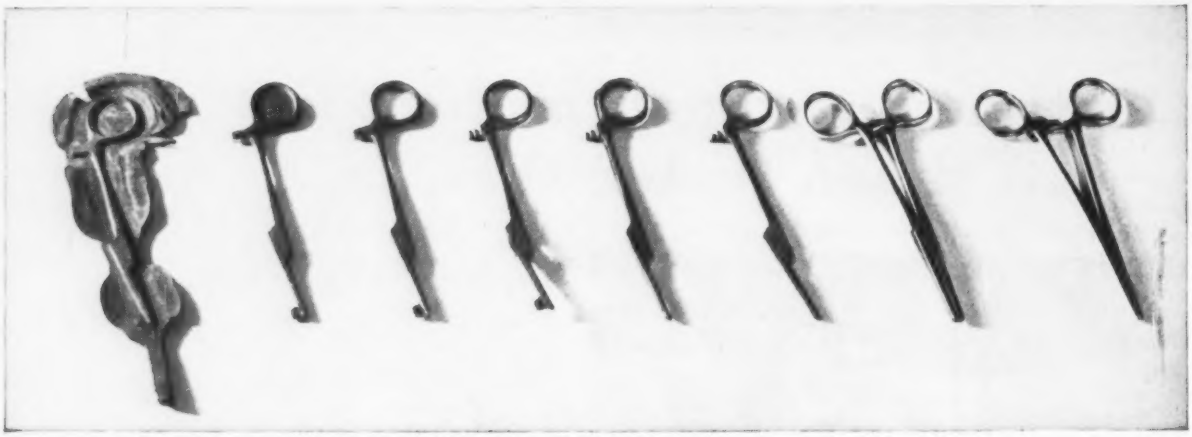

All orders for stainless steel for these artery forceps specify "Carpenter" because of "uniformity from shipment to shipment". Freedom from seams and excellent machining to close tolerances are other reasons given by the fabricator. The stainless is specially processed to meet the rigid specifications. By specifying Carpenter you can take the pressure off both designer and fabricator. High temperatures and stress variations are no longer problems. We'll back up our success stories with technical data and on-the-job service. Call your Carpenter representative for information on the stainless you need. The Carpenter Steel Company, 121 W. Bern Street, Reading, Pa.

Carpenter STEEL

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.
Webb Wire Division, New Brunswick, N. J.

Clean, sanitize, and Jenolize without fumes, flame, or excess water . . .

New All-Electric Hypressure Jenny!

Anywhere that flame, fumes, or excess water are objectionable or hazardous, the new Model E-350 All-Electric Jenny® will solve the cleaning or sanitizing problem. And with the new Jenolizing Process, machinery, equipment, and parts are left with a coating that protects against flash rusting, and gives a glossy, like-new appearance to painted surfaces.

Model E-350 combines the right amounts of heat, pressure, and cleaning solution to handle the majority of cleaning jobs at savings of up to 80% in time and labor costs. Its compact size, portability, low water output, and quiet operation without flame, smoke, or fuel fumes, make it ideal for use practically anywhere in the plant.

Send the coupon today for complete information. You'll welcome the outstanding performance of E-350—and the attractive plan which permits you to prove to yourself the economies of this new All-Electric Jenny.

Perfect for

manufacturing plants, food processors, textile mills, chemical and pharmaceutical plants, metal working and fabricating, petroleum industry, canneries, hotels and institutions, and every other operation where fumes, smoke, excess water are objectionable.

Mail Today!

Please send complete information on new E-350 All-Electric Jenny and Jenolizing.

Name ..... Title .....

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HOMESTEAD VALVE MANUFACTURING COMPANY
Hypressure Jenny Division, P. O. Box 23, Coraopolis, Pa.

HI-FI QUALITY SECURED AT LOWER ASSEMBLY COSTS

Thomson Rivets and Rivet-Setting Machines used by H. H. Scott to standardize fastening procedures.

Any high fidelity hobbyist will tell you that H. H. Scott, Inc., Maynard, Mass., makes America's top quality in high fidelity equipment.

Here you see one of the finest stereo amplifiers made . . . in both chassis and final form. Components are securely and accurately held in uniform tension by 113 Thomson Rivets. H. H. Scott has standardized on Thomson aluminum rivets in one diameter and four lengths.

Rivets get their uniform clinch from any one of the eight Thomson Automatic-Feed Rivet-Setting Machines which H. H. Scott now uses.

All eight machines have identical tooling except for interchangeable anvils. Several sets of numbered, color-coded anvils cover all variations in assembly thickness. Change-over time is a matter of seconds.

E. G. Dyett, Jr., Purchasing Agent of H. H. Scott, reports, "The use of Thomson rivets and rivet-setting machines has produced assembly economies and resulted in lower over-all costs, while improving product appearance and mechanical construction."

Chances are the Thomson Fastening Man can help you improve product quality and reduce your costs. It costs nothing to find out. Make a date with him soon. You'll find him listed in the yellow pages of your phone book. In the meantime, you'll want Thomson's latest catalog. Write today for your free copy to Dept. I.

Style 161 Thomson Automatic Rivet-Setting Machine

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Man-made diamonds add the newest "Touch of Gold" value to carbide grinding

In carbide grinding the product-improving, cost-cutting "Touch of Gold," created by Norton leadership in diamond wheel development, began back in 1930. Today, man-made diamonds are adding something new to the "Touch of Gold." Their use as abrasives is steadily increasing, because of their improved performance and economy.

Norton was first to introduce all three bond types of diamond wheels . . . manufactures with complete uniformity of specification . . . produces the largest line . . . and *certifies* the diamond content of each wheel. Today, similar pioneering continues Norton leadership in the use of man-made diamonds . . . bringing you better performance, longer service life and lower grinding cost for every dollar you spend. NORTON COMPANY, Worcester 6, Massachusetts.

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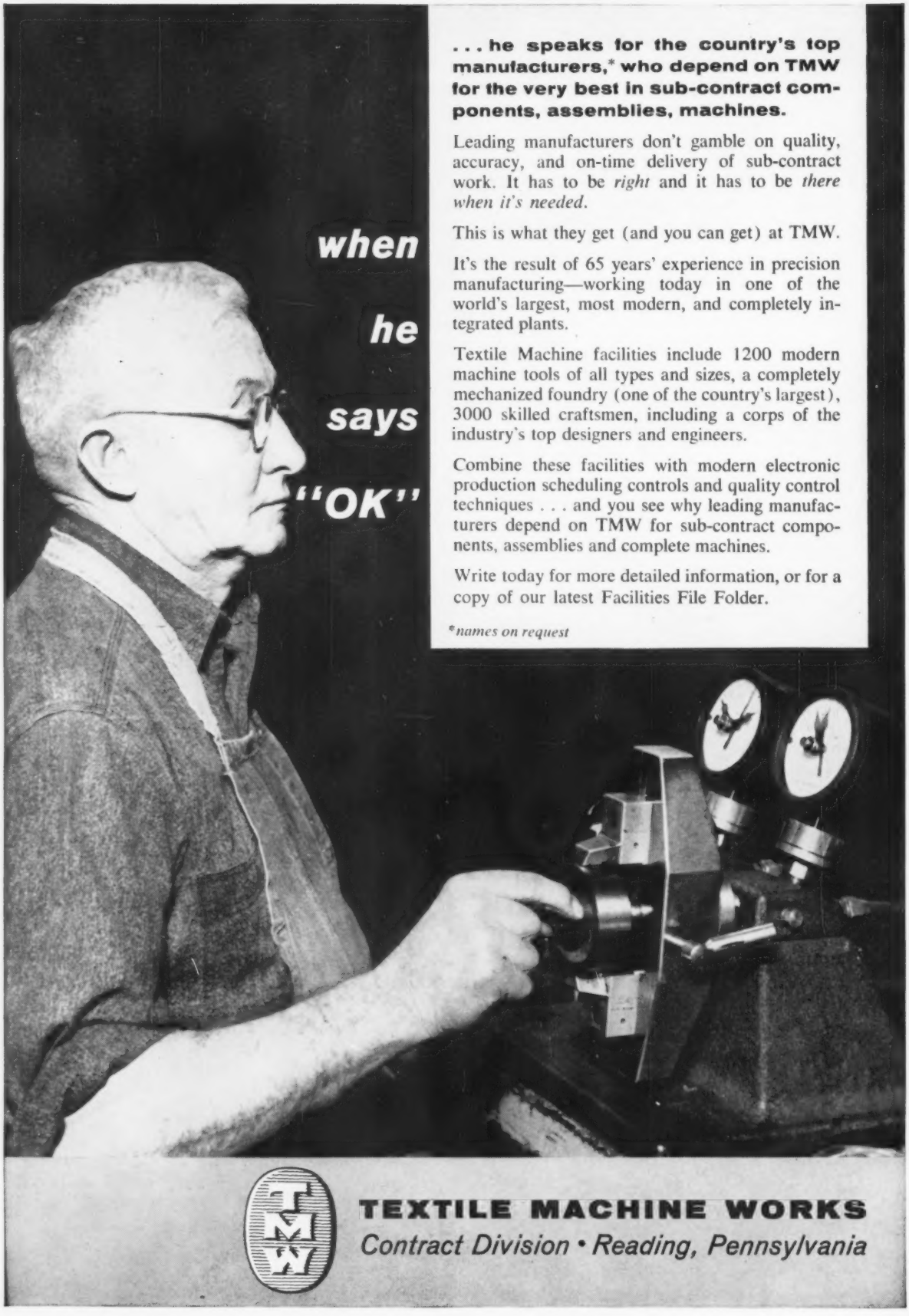
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION:** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



. . . he speaks for the country's top manufacturers,* who depend on TMW for the very best in sub-contract components, assemblies, machines.

Leading manufacturers don't gamble on quality, accuracy, and on-time delivery of sub-contract work. It has to be *right* and it has to be *there when it's needed.*

This is what they get (and you can get) at TMW.

It's the result of 65 years' experience in precision manufacturing—working today in one of the world's largest, most modern, and completely integrated plants.

Textile Machine facilities include 1200 modern machine tools of all types and sizes, a completely mechanized foundry (one of the country's largest), 3000 skilled craftsmen, including a corps of the industry's top designers and engineers.

Combine these facilities with modern electronic production scheduling controls and quality control techniques . . . and you see why leading manufacturers depend on TMW for sub-contract components, assemblies and complete machines.

Write today for more detailed information, or for a copy of our latest Facilities File Folder.

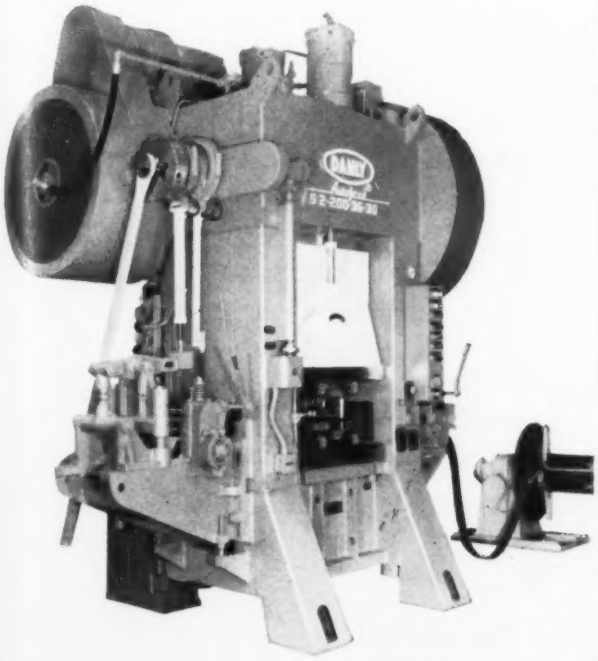
**names on request*

TEXTILE MACHINE WORKS

Contract Division • Reading, Pennsylvania

DANLY® The Leading Supplier to the Stamping Industry

in PRESSES

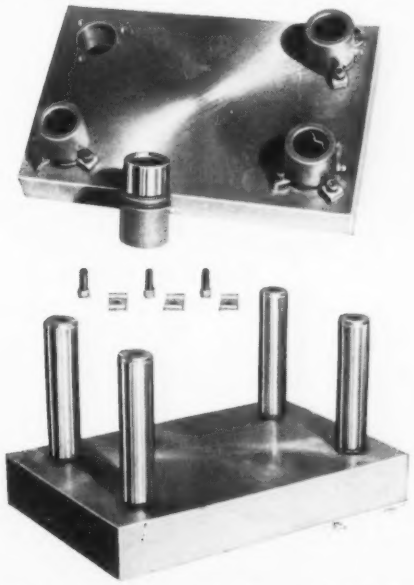


The report of the Business and Defense Service Administration shows that Danly led all producers of presses during 1957. Industry made Danly the first choice because you get lower operating costs with a Danly Press—you can depend on it! Each press is engineered to turn out more accurate stampings . . . to produce more units per shift . . . and to reduce profit-eating maintenance and spare parts inventories.

There are many new developments you should know about, such as the Quick Die Change feature available on all Straight Side Presses . . . single, double and triple action . . . the modern high-production Autofeeds . . . and the completely modern line of Open Back Inclinable presses just introduced. See how Danly can help you reduce costs and give your products the stamp of leadership!

Write for the new Autofeed Catalog that gives full information on Danly Presses for high-production stampings.

in DIE SETS and Die Makers' Supplies



With the introduction of the Demountable Bushing Die Set, Danly is now working on its fifth million in die set production. Included in this production are die sets mounted in five Danly Autofeed Presses that produced a million pieces per grind with an average of 219,000 pieces per .001 inch of die grind.

In every instance, Danly can meet your most exacting diemaking specifications with a die set—standard or special. Since pioneering the first mass-produced precision die sets 36 years ago, Danly has continuously developed new production, inspection and distribution methods to serve you better.

Today, there's the new Danly Die Set with Demountable Bushings being assembled in a factory branch or distributor assembly plant near you. It is your fast, convenient source for toolroom and pressroom supplies that bear the stamp of leadership. Danly facilities for special Die Set manufacture are also improved and expanded .

Send for money-saving facts. Write us and your distributor or branch will give you helpful information on Danly Die Sets.

1959

DANLY MACHINE SPECIALTIES, INC. DANLY **2100 S. Laramie Avenue, Chicago 50, Illinois**

"We've cut stainless costs with ferromanganese-silicon"

Ferromanganese-silicon allows savings of as much as $8 per ton, depending upon practice, in the production of high-manganese stainless steels. It also reduces manganese costs for the chromium-nickel grades of stainless.

The alloy is both an efficient slag reducing agent and the lowest-priced source of low-carbon manganese currently available. For details on cost reductions in your practice, contact your UNION CARBIDE METALS representative.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

Ferromanganese-silicon gives lower costs, rapid solubility, and high manganese recoveries.

UNION CARBIDE METALS

Electromet *Brand Ferroalloys and other Metallurgical Products*

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

TIGHT MONEY is now a fact of life and will continue to be for many months. Whether it will have a severe effect on your business remains to be seen, but it will need closest watching. If your sales depend on financing by your customers, you may feel the restrictions.

CONSTRUCTION may be the first area where tight money hurts. But there is no indication of a slowdown yet. Dept. of Commerce reports new construction increased seasonally in May and set a new record for the month. On a cumulative basis, expenditures for the first five months also set a new high. Work on housing dominated the outlays for private construction.

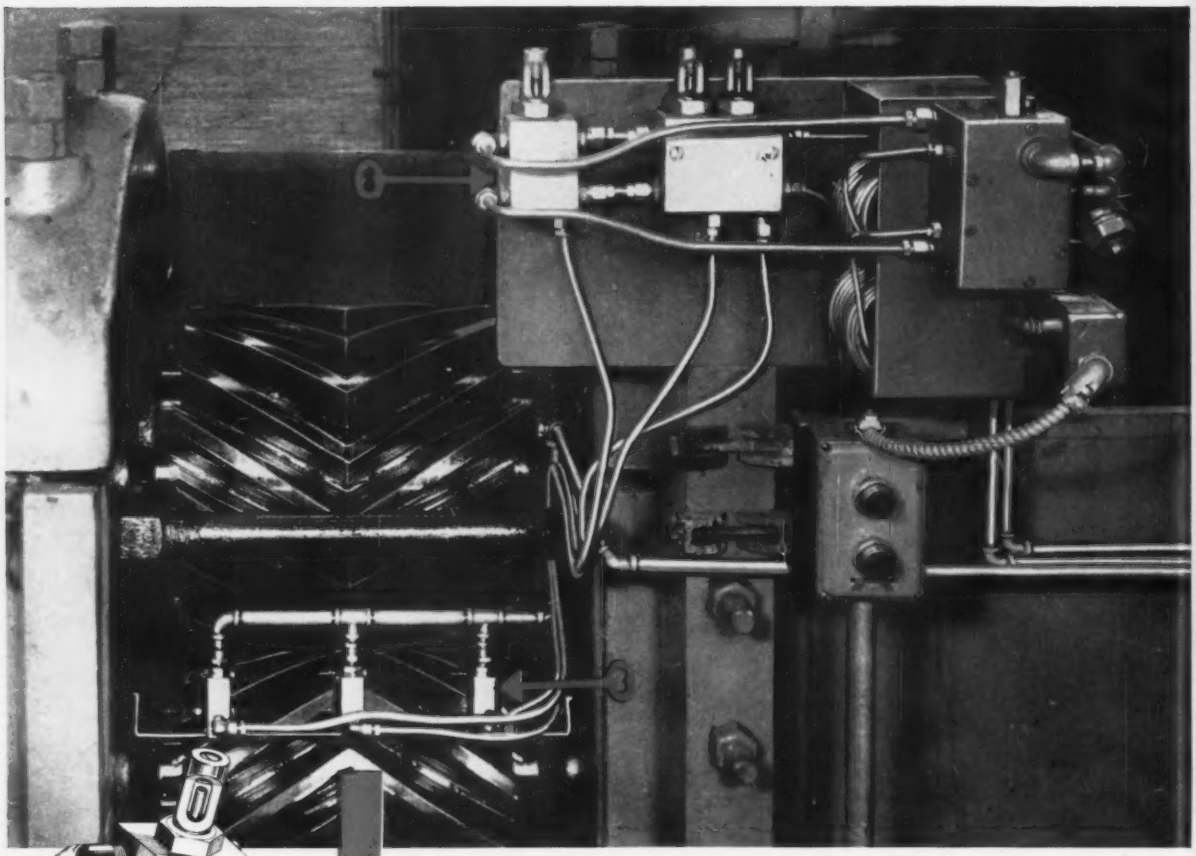
THE APPLIANCE MARKET is approaching a dilemma. Sales of most appliances are running nearly 30 pct ahead of last year, but inventory reports are contradictory. Some makers are planning cutbacks in production while others reflect growing optimism.

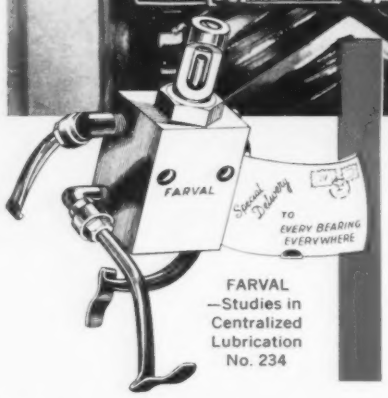
SMALL CARS, NOW SCHEDULED FOR EARLY FALL production are being viewed with misgivings by Detroit traditionalists. They think any break with the old success formula is a retreat. But the breakthrough in precedent is bound to result in a continuing series of changes and a climate more receptive to new ideas.

FOUNDRY INDUSTRY'S new equipment spending spree has slackened off a bit. New order index for March showed a 30 pct drop from record-breaking February. But authorities point out that another such record-breaking month was too much to expect, that orders are still double the average for last year.

NEW ORDERS AND SHIPMENTS from all manufacturers hit new records in April, Office of Business Economics of the Dept. of Commerce reports. Unfilled orders were steady and inventory values continued to gain, but slowly. Sales of manufacturers totaled $30.8 billion while new orders reached $30.7 billion. Incoming business was up 3 pct over the month.

GREAT BRITAIN WILL INCREASE U. S. auto import quotas, from 650 cars to a new ceiling expressed in dollars--$4.2 million. The ceiling may be academic, however, since Britain bought only 450 U. S. cars last year. Britain imposes a 30 pct import tax on U. S. cars, compared with an 8.5 pct tax levied here.





FARVAL
—Studies in
Centralized
Lubrication
No. 234

$715.00 savings in one year paid for this automatic Farval Spray System

In this prominent brass manufacturing plant, herringbone gears for the hot commutator roll presented an acute lubrication problem. Manual lubrication procedures were inefficient, costly, and used excessive lubricant. Also, poor housekeeping – due to equipment being covered with wasted lubricant – was reflected in a high clean-up labor cost.

A modern Farval Spray Valve Lubrication System was installed and immediately solved the problems. Now the plant's operators report:

- Reduction of 84% in amount of lubricant formerly required
- Exactly measured amounts of lubricant are automatically delivered at six-minute intervals – eliminates the need for workmen to go near meshing gears
- Since installation of Farval, no maintenance has been required
- Housekeeping is no longer a problem – leakage and wasted lubricant have been entirely eliminated

Check with your Farval Representative and get the complete story on how these modern, automatic, centralized lubrication systems can improve your production operations – cut over-all costs, too. Or, write for free Bulletin 60-A.

The Farval Corporation, 3283 East 80th Street, Cleveland 4, Ohio.

® Reg. U.S.Pat. Off.

Affiliate of The Cleveland Worm & Gear Company
(Subsidiary of Eaton Manufacturing Company)

KEYS TO ADEQUATE LUBRICATION

—wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

IN ACTION: New York State Senator John Hughes addresses Syracuse Practical Politics Forum.

Political Action for Business: How to Make It Work

There's an old saying that business and politics don't mix. New programs are proving they do mix and with good results.

There are differences of opinion on intent and effect, but most agree that it is a worthwhile effort.—By G. J. McManus.

▪ Industry's political crusade is moving from the talk to the action stage. Top management is sincerely throwing its weight behind it, authorizing the tools and necessary programs.

"This thing has suddenly exploded," says General Electric Co.'s J. J. Wuerthner, Jr., a pioneer in the movement. He estimates that there are tens of thousands going through company or area programs of political indoctrination. GE alone has training programs in at least 15 states.

Lots of Action—Since Feb. 8, the U. S. Chamber of Commerce has received orders for 5300 sets of its action course in practical politics. Course manuals are currently going out at the rate of 1000 a week.

In Syracuse more than 1000 businessmen and 40 companies have taken part in the political action program of the city manufacturers association. Sponsors had received 5000 inquiries on the program at last count. Twelve other cities have adopted the program.

In Pittsburgh an eight-week political training course began June 1 for 150 men representing 29 companies. There are five study groups underway in Minneapolis; two in Lexington, Ky.; four in Shreveport, La. Schenectady expects to train 500 businessmen for politics by the end of the year.

Leadership Needed—American Can Co. has formed a 153-man executive team to speak up on political matters. Ford Motor Co. has devised a step-by-step schedule of political action extending through October 1960. At the home office of Kopper Co., Inc., one-fifth the salaried personnel have applied for political training. Chase Manhattan Bank has sent out 170 sets of

the Chamber course to affiliate banks.

Where individual employees are given specific programs and high-level encouragement, a massive response is indicated. Last July Gulf Oil Co. outlined a program of political activity to shareholders, employees and dealers. Within a few weeks, it had requests for 40,000 reprints. Within one week's time, the company had assigned two people full time answering a "flood of letters," about 95 pct favorable.

"Recent developments have made it fashionable for businessmen to enter politics," says Mr. Wuerthner of General Electric.

How to Start—The method of entry varies but generally takes in three distinct types of activity:

1. Individual employees are being educated in political ways and are being encouraged to take part in politics.

2. Facts on political issues are being presented to employees by companies.

3. Management's views on issues are being presented to the general public and to employees.

Of the three, training programs are probably getting the biggest push. They involve no commercial or legal hazard. They aim at filling the greatest need—the need for new people in politics and lots of them.

Syracuse Plan—One of the earliest coherent training programs is the Syracuse Plan, which was put into operation last spring under the leadership of Mr. Wuerthner. The plan has three general stages. First, a pitch is made to top management on the need for political action. Second, company representatives are given an intensive two-day indoctrination. Third, the initial trainees serve as instructors in courses conducted in plants.

This pattern is being followed in other localities. Veterans of the movement agree that the first step is to sell top management. In Pittsburgh, business leaders got a double dose of political talk before the present program started.

On March 24, Pittsburgh executives were urged into politics by Ernest G. Swigert, president of Hyster Co. and an official of National Association of Manufacturers. On March 31 a group of 400 heard a similar message from Arthur H. Motley, a vice president of the U. S. Chamber of Commerce.

Progress in Pittsburgh — After Mr. Motley's talk, 45 companies said they would take part in the Chamber program. A pilot course was then set up with 16 men from Gulf Oil, Westinghouse, Alcoa and others attending a series of meetings. This has been followed by an expanded program with 150 enrolled.

Numerous training plans have been devised by associations and companies. The Chamber program deals with things like political clubs, the political precinct, political party organization, etc. Discussion leader manuals are supplied at $12 a copy. Sets of eight student manuals are available for $6 a set.

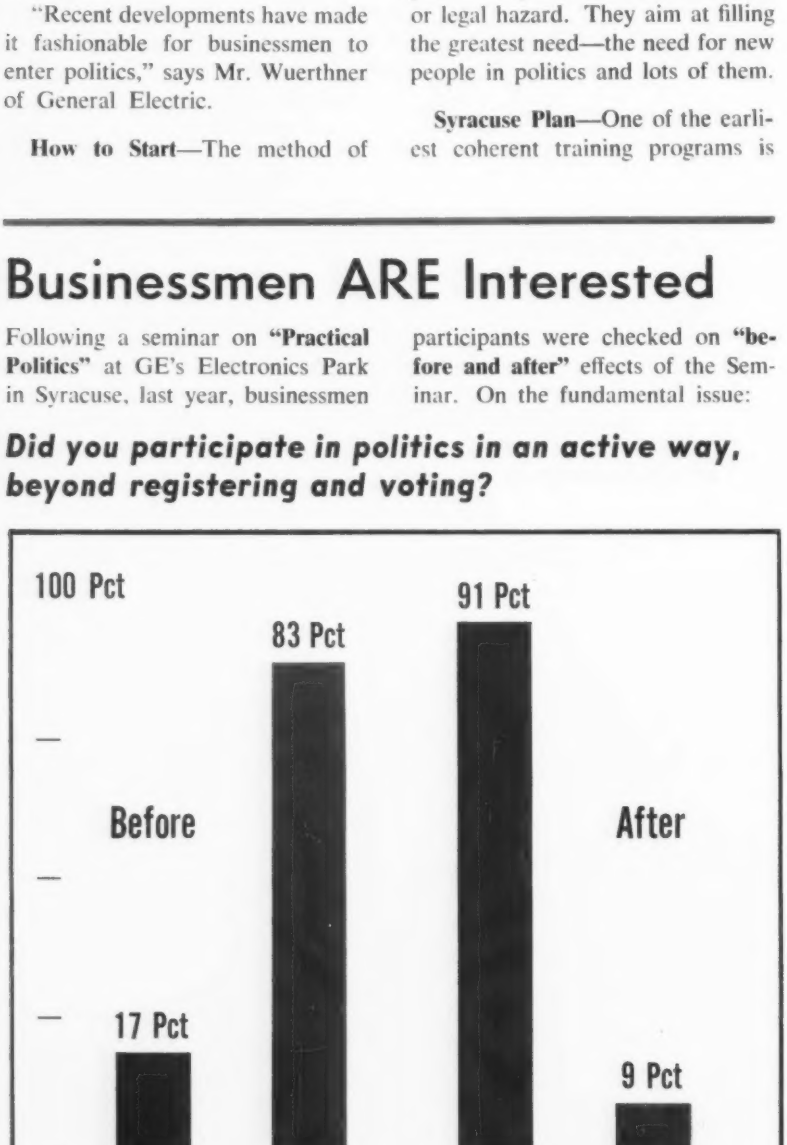
NAM charges $300 for a training kit that includes visual aids and training manuals for a six-part program. Manuals can be ordered individually.

Initial aim of most programs is to promote political activity at the local level. Operation New York is a new development that goes beyond the individual community. An outgrowth of the Syracuse plan, it

Businessmen ARE Interested

Following a seminar on **"Practical Politics"** at GE's Electronics Park in Syracuse, last year, businessmen participants were checked on **"before and after"** effects of the Seminar. On the fundamental issue:

Did you participate in politics in an active way, beyond registering and voting?



is an organized effort to start political movements in business communities throughout the state. Trained teams go into a new town. At gatherings of key businessmen, they tell why companies should get into politics and how to do it.

Effects Debated—How effective will all this training activity be? One working politician is pessimistic.

"You can't learn politics from a text book," he says. "These sessions will operate in a vacuum and wither away."

The experience of Syracuse shows this need not be true. County chairmen of both the Democratic and Republican parties attended early sessions of the program. In the regular training phase, politicians took part in four of the six sessions.

Prior to the program, only 17 pct of the Syracuse participants had ever done anything more than vote in an election. A survey taken after last November's elections showed that 91 pct engaged in some form of political activity.

Will It Last?—Johnson & Johnson has had similar results from its political program. Before the push was started in 1951, some 40 employees held political office. By the spring of 1958, there were 200 office holders within the company.

Another question the politicians ask: Will business remain interested in politics? Is the current wave merely a fad?

"Last year they were all talking about Russian industry," says one official. "This year it's politics. Next year it will be something else."

Mr. Wuerthner rejects this thinking. Political programs have a built-in continuity, he feels. Once a man gets the bug, he's hooked.

"Whether they like it or not, companies can't turn off the political interest being generated," says Mr. Wuerthner.

Negative Effects?—Finally there is the touchy question of whether a company benefits from strictly non-partisan training programs. This difficulty is bluntly stated by Carl L. Biemiller, NAM's director of public affairs.

"There is little sense in making merely more Democrats or more Republicans when it is more conservatives we need," he says.

In line with this thinking, the NAM course, while non-partisan, "emphasizes the fundamental tenets of conservatism and the basic doctrines of business thought a bit more strongly than most."

The Chamber of Commerce course is neutral enough to win approval of labor spokesmen. "An excellently prepared job," says Emery F. Bacon, director of education of United Steelworkers.

Must Have Freedom—Mr. Wuerthner prefers the word, "bi-partisan," to "nonpartisan." He points out that political activity must be partisan to be effective. But he feels this action must come from the free movement of individuals into existing parties.

If industry attempts to build a pressure group to its image, he says, it will wind up with another association of manufacturers, interested in politics but outside the real political workings.

Without any steering by sponsors, a training program can probably rely on the conservative leanings of businessmen to produce conservative politicians. However, job levels would be a factor.

Open to All—Koppers Co. feels a truly nonpartisan program must be open to all employees, salaried or hourly paid. The 334 training applicants in the company's first group range from vice president down to secretary.

Neither by selection nor by training does Koppers attempt to back official views through political recruiting. But in a distinct and older program, the company has moved very positively into political issues. Employees are given facts on controversial questions. They are given management's views on issues.

In recent issues of its employee publication, Koppers has criticized federal aid to schools, supported the Eisenhower budget, criticized Teamster leader Hoffa. Employees get regular reports on inflation, taxes and similar subjects.

How GE Seminar Stimulated Political Action

From 254 Responses—

100 Pct Registered
100 Pct Voted
39 Pct Donated to campaigns
18 Pct Joined political organization
45 Pct Canvassed voters
29 Pct Distributed campaign material
51 Pct Attended rally or campaign event
8 Pct Wrote letter to editor
8 Pct Solicited funds
23 Pct Worked on election day
37 Pct Assisted election committee
11 Pct Helped formulate strategy
23 Persons Became election of party officials
4 Persons Ran for party office
4 Persons Were appointed to party office
5 Persons Ran for government office
2 Persons Appointed to government office
7 Persons Elected to party convention

How Imports Undersell U.S. Brass Mills

Item	Price Per Lb. Imported	Domestic
Copper Water Tube, 60 ft coils:		
½ in. K	$.1895 ft	$.2741 ft
½ in. L	.1665 ft	.2380 ft
½ in. M	.1095 ft	.1859 ft
1½ in. DWV	.4295 ft	.5880 ft
Copper Tubing—.853 OD x .022 in.	.6228	.7637
Soft Cold Rolled Copper Coils—16 in.	.4400	.5322
Cold Rolled Copper Sheets:		
36 x 96 soft	.4900	.5633
36 x 96½ hard	.4900	.6013
70/30 Brass Strip Rolls—12 in. width	.4400	.5322
Admiralty Brass Condenser Tubes— 1 in. x 18 gage x 34 ft	.56 to .57	.8167
Free Cutting Brass Rod —		
Round—$\frac{5}{32}$ in. to $\frac{3}{16}$ in.	.304	.421
$\frac{1}{4}$ in. to $\frac{5}{16}$ in.	.285	.358
$\frac{7}{16}$ in. to ½ in.	.274	.331

Source: Copper & Brass Research Assn.

Brass Mills Ask for Protection

Lower cost imports are really hurting the U. S. brass industry, says CABRA report.

Importers claim the report is slanted. They'll tell their side of the story.

▪ The battle over brass imports is erupting again.

In a widely circulated report, "A Study of an Industry's Decline Due to Our International Economic Policies," the Copper and Brass Research Assn. says point blank:

"It is economically unsound and fundamentally unfair to force domestic brass mills to compete against low wages paid by foreign mills.

"It is fundamentally unfair to give foreign brass mills the American markets developed by domestic mills at great expense."

Importers Prepared — The CABRA report is heavy with statistics to prove its contention that "a new policy on imports is urgently needed."

Importers say they're ready to reply. Officially, William J. Barnhard, counsel for the American Importers of Brass & Copper Mill Products, Inc., calls the CABRA document "a pre-attack bombardment". He looks for the actual assault to center on appeals (1) to the Tariff Commission based on the escape clause in the General Agreement on Tariffs and Trade, (2) to the Office of Civilian Defense Mobilization based on the National Security Amendment in GATT, or (3) to Congress for legislation to reduce imports.

Foreign Aid Handout—The basic argument of domestic mills is that lower labor costs overseas, combined with the U. S. policy of practically turning the brass market over to some friendly nations to help them build dollar reserves, will drive the domestic industry to the wall unless something is done.

They point out the U. S. brass mill industry operated at only 42 pct of its 1943 capacity in 1958, while imports have more than doubled since 1955.

CABRA also notes that the U. S. has become a net importer of brass mill products. We crossed the line in 1951 and the gap has been widening to where imports were 11½ times greater than exports in 1958.

Supply Called Unsure—The report takes a swing at foreign mills for (1) taking advantage of their lower wages to quote prices directly as a specific pct below the going U. S. price, (2) hitting the U. S. industry by using equipment they received under the Marshall plan, and (3) being a very unsure source of supply that has and will pull out fast when the economic climate changes.

They also object to the policy of many countries that are getting rich selling their brass mill products in the U. S. while deliberately and effectively blocking U. S. mill products from their own markets.

The importers say they'll fight back. But no one is squaring off yet.

Mr. Barnhard says the CABRA study is "vulnerable in many respects."

The Weak Spots—He says it cites the low earnings in 1957 and the first half of 1958 to prove a decline and ignores the booming business during the last half of 1958 and this year. Shipments from U. S. brass mills in the first quarter of this year topped that period last year by 41 pct, he says.

Also, he says CABRA fails to properly equate the competition from aluminum, steel, and plastics in its market problems. And, he continues, while the study notes wage differences that favor Europe, it ignores differences in power costs, interest rates, and other production costs that favor the U. S.

Can a Steel Strike be Averted?

Perhaps Not, but Odds Shift Toward Short Walkout

Despite all the noise, the atmosphere in steel labor contract talks has improved.

Both sides are looking for a face-saving compromise to avoid a long shutdown. — By Tom Campbell.

▪ From the angry blasts directed at each other by steel labor and management, it looks like a steel strike is inevitable. Still, there will be more real collective bargaining this week than there has been to date.

A month ago, the odds favoring a long and bitter steel strike were (according to The IRON AGE) about 8 to 2. This week they are about 6 to 4 in favor of a short strike. The shift has been brought about by an apparent change in the steel union's stance.

McDonald's Alternatives — It looks as though David J. McDonald, union chief, may have to make an offer of a very moderate wage demand. Before doing this, he will have to decide just what strike strategy to use—if any. It is doubtful that he could control his men under a day-to-day contract extension. And it is highly debatable whether he could get anywhere with a selective strike—that is, striking some companies and letting others operate. But he might try either of these moves.

What neither side is willing to concede publicly is that both are boxed in by President Eisenhower's repeated call for a non-inflationary settlement. Along this line, the steel companies are standing firm on their first offer—a wage freeze—and are waiting to see just what, if anything, Mr. McDonald will offer in the way of a non-inflationary agreement.

Ahead of '56 Schedule—Negotiations actually are running ahead of the 1956 schedule. The usual window-dressing and down-to-earth probing are well advanced. Both sides have a much better idea of each other's viewpoint at a much earlier date than was the case in 1956. There is still considerable time for labor to avert a strike—that is a strike worthy of the name.

If, for example, the steel workers walked off the job on July 1, a Wednesday, and went back to work on Monday, July 6, with some sort of agreement, it could hardly be called a strike. But such a "shutdown" would indicate the men are behind Mr. McDonald.

1959's Union-Management Crisis

McDonald on the Spot—In past years, the steel industry was on the hot seat before the end of the contract period. This time the union is on a much hotter seat if for no other reason than that Dave McDonald knows the position of the steel industry makes no allowance for anything like his public demands—or even a watered down version of them.

There are so many new factors in the steel picture this year that the odds for a no-strike settlement will change often between now and the end of the month. If a shutdown comes and lasts for more than a few weeks, that will be a sign that good union judgment has gone out the window.

Who Will Make First Move?—Recent reports of a possible settlement or a change in adamant positions—reports which appeared in United Press International stories—have been denied so vehemently that the denials have lost some of their force. Regardless of who backs down from what position, the odds favor some show of statesmanship on both sides before the midnight June 30 deadline.

There is a lot of so-called "face" mixed up in this year's hassle. The steel firms have spread the news far and wide that they will not budge an inch. The union has been just as positive about getting a contract as good as it did in 1956. Both sides can't be correct to the full extent of their public statements.

Better Atmosphere — Granted that this week a steel strike appears certain, there is still time for a change in the outlook. The IRON AGE has reason to believe that the atmosphere for a settlement without a long strike is much better than it was a month ago. But it will be at least two weeks or so before this estimate can be tested.

If the mills are not to be shut down on July 1, Mr. McDonald will have to translate his "flexibility" into a definite offer that is practical in relation to today's conditions. When and if that happens, we will probably hear from the steel side. It is likely to remain pat on its original offer until Dave makes a pitch.

What No One Wants—If at the last minute Mr. McDonald decides to slug it out when he knows he can't get a big deal, then all bets are off. Anything can happen then to produce what no one wants—a long and bitter strike with loss to the men, to the union, and to the companies and their customers.

What Worries Appliance Makers?

Sales Are Up, But So Are Inventories

Right now appliance sales are running well above 1958's recession levels.

But large dealer inventories have some manufacturers thinking about production cuts.

▪ Appliance makers are busy, but concerned.

On the one hand, sales are running well above 1958's recession levels. From all indications, 1959 will be a good year for the industry, with sales improved 5-10 pct.

Gains Over '58—Sales of RCA Whirlpool appliances, for example, during the first four months of the year were 37 pct ahead of 1958. And factory-distributor inventories dropped more than 30 pct in terms of available supply.

Electric refrigerator sales for Whirlpool were up 41 pct over '58, with automatic washer sales 22 pct ahead of a year ago.

For the entire appliance industry dryer sales are about 17 pct better than in the first four months of 1958. Refrigerator sales are up 24 pct. And wringer washer sales for the first third of 1959 were 16 pct above '58 levels.

Trend Spotters? — Yet with all this achievement some appliance makers are worried. Why?

It may be significant that the same manufacturers who first spotted the 1958 upturn are now cutting back or leveling off production. Their aim: Decreased output and reduced finished goods inventories in the next three or four months.

If there's no steel strike, these cutbacks will probably be deeper. They will probably bring steel mills some order cancellations for cold-rolled and galvanized sheet.

At one firm it took marketing six weeks to convince sales it was time to slow output. Sales is still not convinced it was the right move. Another company is increasing production levels to record heights in June with everybody but the sales force registering guarded alarm.

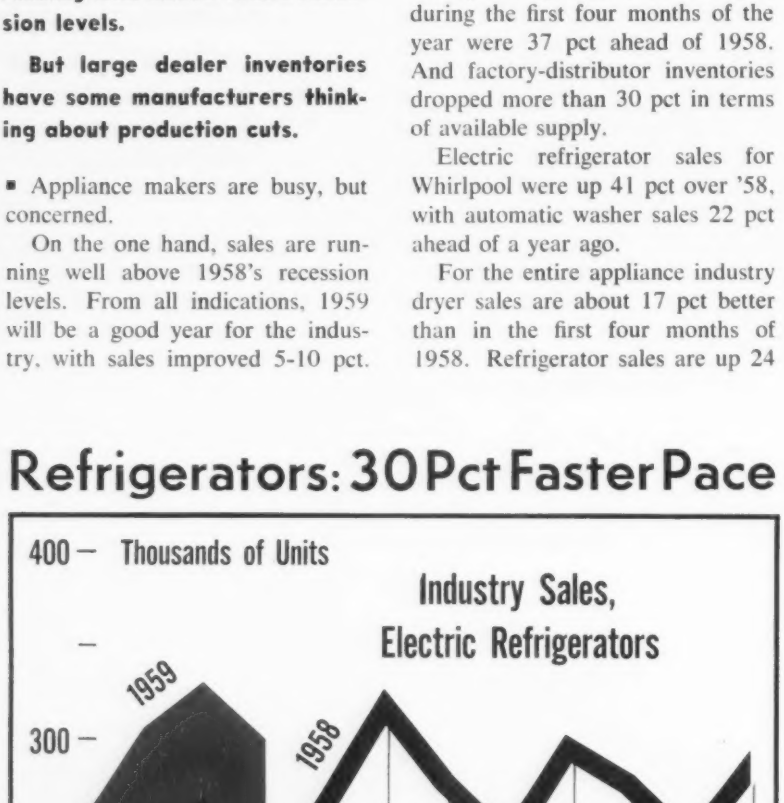
Gathering Doubts — Here's how appliance makers view the current market:

A sales vice president: "We'll beat 1958 production by over 15 pct. Our June production is at May levels and that's a record. But we're arguing about inventory every day. We know that one of our big competitors is already slackening output."

"We believe retail buying is losing some of its snap. At least in some product lines. We know that retail sales dropped 8 pct below the April forecast in one line and 14 pct below the May forecast in another. If you ask me, the refrigerator industry is already in trouble."

Why Cut Back?—A major producer: "We're going to keep production at the May level during

Refrigerators: 30 Pct Faster Pace



June. You can't sell appliances if you haven't got them. But we know we're sticking our necks way out."

Another manufacturer: "We're cutting back. Not much, but we're cutting back. One reason is that we're not trying to push sales in areas that have been low-profit producers. The other reason is that we've just got a hunch it's time to sit back and see how high dealer inventories of finished appliances really are."

Summer Changeover—These are the storm warnings. They are buried in a confused production picture. Portions of the appliance industry normally begin to cut back production at this time of the year.

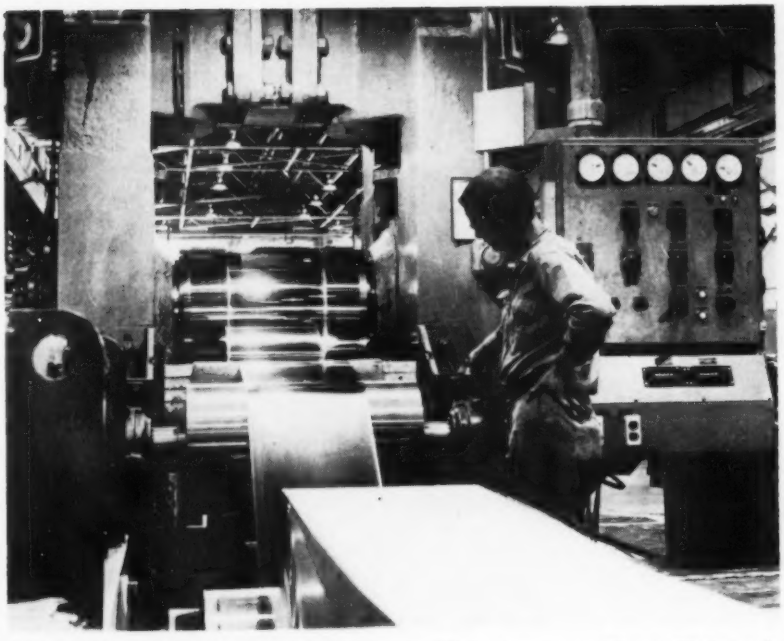
Early summer season usually sees a June-July drop in production of several lines of major appliances as retail sales fall during the vacation season.

High Inventories—Some manufacturers have run up inventories of finished appliances for storage to cover sales if a steel strike cuts factory output. These may run as high as four weeks. Distributor inventories, next link in the chain between appliance makers and customers, are estimated at 7-11 weeks.

Dealers are the next link and the biggest question mark. One appliance maker, who has already cut back some production schedules, believes dealer inventories may run to 9 weeks.

Total finished goods inventories in the manufacturer-dealer pipeline are estimated at 17 weeks. This is somewhat high for an industry which has traditionally accepted a 12-week finished goods inventory as a safe rule of thumb.

. . . Cause Concern—Several important appliance makers eye the inventory figure with mild, but growing, concern. The appliance slumps of 1954 and 1957 were largely due to topheavy finished goods inventories. It's estimated it takes about six weeks to spot a dangerous dealer sales slump.



ROLLING STAINLESS: Modern two-high temper mill at Universal-Cyclops new plant, Coshocton, O., assures correct hardness and brings out the luster of stainless steel strip.

New Stainless Mill

▪ Two important steel trends were pointed up last week when Universal-Cyclops Steel Corp. unveiled a new stainless strip plant at Coshocton, O.

The new mill illustrates how the growth of stainless is pulling specialty producers into competition with tonnage mills. It shows how the need to modernize is forcing mills to expand at the same time.

Doubles Capacity—For Universal-Cyclops, the Coshocton facility represents an investment of $8 million so far. It gives the company a big, modern reversing mill, a continuous annealing and pickling line, a temper mill, and a full complement of grinding, scouring, and slitting auxiliaries.

The new mill doubles the strip rolling capacity of Universal-Cyclops, adding 20,000 tons to the 12,000 tons already on hand. This addition comes at a time when the market is already overloaded with flat-rolled stainless production.

More Expansion Coming—It is estimated there are about 400,000 tons of strip rolling capacity in the country. Shipments of strip in recent years have averaged about 200,000 tons.

Moreover, capacity keeps growing. Something like 10 cold mills have been installed by U. S. producers in the past few years. The new Universal-Cyclops plant, for example, is only part of a $50 million expansion.

Reason for Confidence — The production surplus has made for rough competition in stainless but Universal-Cyclops still feels it can expand its share of the market. The company feels it has the advantage of long experience in meeting fussy requirements of stainless production plus close ties with the relatively few customers who make up the strip market.

More Research, More Team Effort In Future Defense Programs

This is the fourth and final part of this series on the changes in defense concepts and their effects on industry.

Industry and military authorities agree that new programs are too complex for even the giants of industry to take on alone.

■ In the wake of explosive changes in military technology and defense concepts, a pattern of defense business is starting to take form.

Gone are many of the traditional weapons, vehicles and aircraft. In their place are giant missiles, nuclear-powered submarines, and military vehicles of entirely new construction.

To take part in new defense business, each defense contractor will have to make his own evaluation of future defense needs. Then he must build his efforts around his own capabilities in relation to the needs of the armed forces.

Defense Trends — Toward this end, some generalizations about future defense business can be made:

There will be fewer, but bigger defense projects. With weapons growing in capability and expense, the number of weapons systems has to be smaller.

There will be an extension of the "team" approach, with several major contractors working together on a single weapons system. The new projects are too great in complexity and cost for even the giants of defense to go it alone.

Research and development will play an ever greater part in the defense picture. This means more emphasis on scientific and technical personnel and research facilities.

Subcontracting will continue to be a major factor in defense business. But reliability demands of new weapons parts dictates that subcontractors must be highly skilled specialists in their field.

Production, meaning the ability to produce large quantities in a short time at a low unit cost, is dead in defense work. In virtually all areas of defense business, skill and a high degree of quality control make up the important factor.

Financial Structure—Brig. Gen. Austin W. Betts, military executive assistant to missile specialist William M. Holaday, analyzes the financial structure this way:

"Look at what has happened to our missile systems. When each is replaced, the cost increase is up by factors, not percentages. Assuming that the defense budget is not going to hit $80 or $90 billion a year, there will have to be fewer systems and cutbacks in marginal facilities.

"But these systems are so complex and demand so many capabilities across the board, there will have to be more team effort."

Subs Needed — Gen. Betts also places a lot of importance on the subcontractor. "They have the special capabilities and the prime contractors will have to use them. Those who want to stay in defense business will pull together a group of subcontractors that cut across the board. There will inevitably be a closer company relationship."

Currently, the three military services have budgeted a total of $3.8 billion for research, development, testing and evaluation, nearly 9 pct of the entire Defense Dept. budget.

About $120 million of this is for basic research, mostly under small contract with non-profit organizations such as university laboratories.

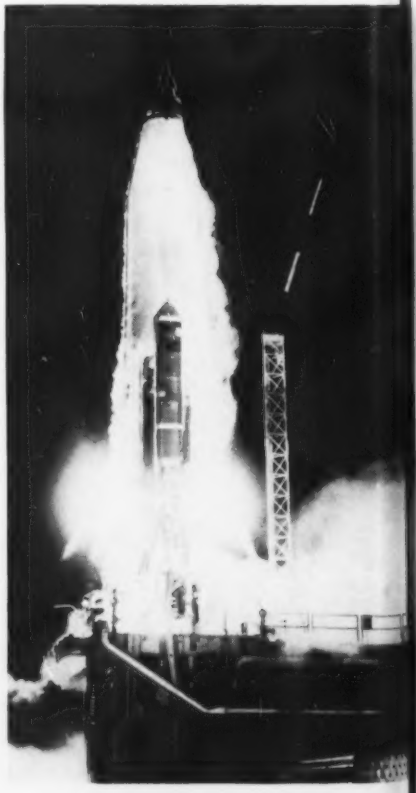
Another $750 million is earmarked for government facilities, including test and launching sites such as Cape Canaveral.

Limit on Research — The remainder, about $2.83 billion, is applied to the research and development of everything from weapons systems to component parts through private contractors.

Asked if this $3.8 billion figure is likely to increase annually, a top Pentagon authority pointed out that the limit is not so much on financing, but on facilities and scientific manpower.

"This brings us back to the national problem of increasing our

How Research



technical ability," he said. "Skills are a resource problem as much as money. Even with an increased budget, we couldn't get a lot more new weaponry."

Too Much for One — General Orval Cook, president of Aerospace Industries Assn. (formerly Aircraft Industries Assn.) sees a greater development of the team effort as inevitable.

He points out that even the largest companies not only don't have the facilities for the broad program of a new weapons system, but do not have the necessary financing, which also grows in magnitude.

Profit in Research? — And proposals come before the development contracts which may begin to show some profit. However, many defense contractors contend that the research and development phase, which does not assure a production contract, will have to be made more profitable.

One headache in defense R and D today is that much of the work on defense research is not readily applicable to commercial use, which was not the case in "old fashioned" weapons. This is another reason why many believe industry will have to be encouraged to get into defense research work by making it more profitable.

"However, the military has never disallowed a profit." contends a Pentagon source. "But the burden is on industry to negotiate a profit."

Where It Goes—Just where the money goes into a weapons program is impossible to break down entirely. An Aerospace Industries Assn. estimate does it this way:

A long range ballistic missile site may have 10 missiles, each costing about $2 million. But this is less than 20 pct of the cost!

Spare parts for flight equipment add another 10 pct. Technical facilities to operate the site involve a full 30 pct and the remaining 40 pct is in ground support equipment.

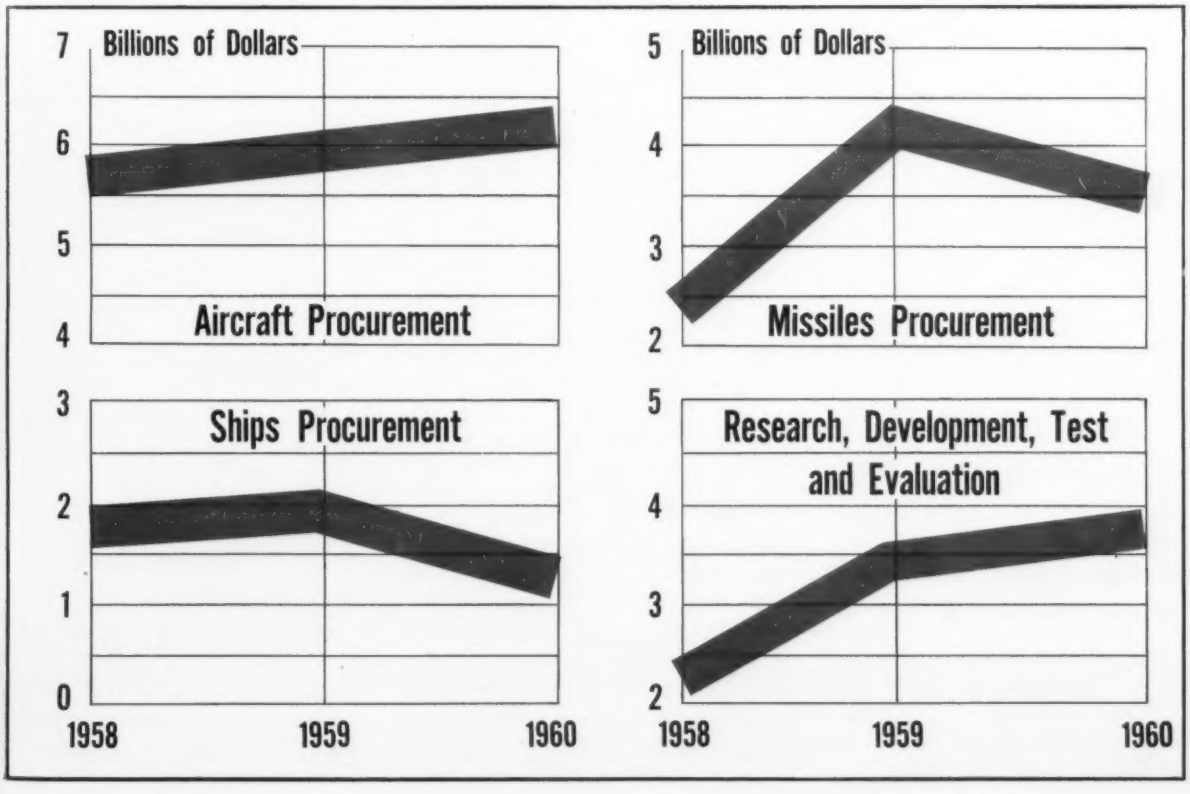
Weapons Controversy — In the short-term defense picture, a lot will depend on controversies now going on in the Pentagon, with some missiles about to be phased out, others retained. The Nike-Bomarc incident is a current example.

It's pointed out that our missiles are obsolete in a technical sense by the time they are ready for operation, but that there's a wide difference of opinion on how much potential improvement makes a missile obsolete.

Capital Needs — Another point raised by General Cook is that the new defense concept is going to demand new facilities and new tools. This creates a capital spending of a kind, but of a specialized kind.

He says new machinery and machine tools must be developed to perform their operations to a much higher degree of accuracy. New materials will need new tools.

Takes a Bigger Share of Defense Budget



H-W Through the Looking Glass

SQUINT: A metallographic microscope to determine mineral association in refractories is standard equipment in the new, $2 million Garber Research Center, opened recently by Harbison-Walker Refractories Co., at West Mifflin Township, Pa. The lab is named for Earl Garber, H-W president under whose administration the company achieved its greatest growth record. The new facility will specialize in developing new refractories, particularly along the line of refractory castables.

Cut Tantalum Price

Union Carbide Metals Co., division of Union Carbide Corp., has dropped the price for its high purity tantalum by $60 per lb, to $35 per lb.

The company attributes the move to "increased demand which has been paced by expanded production facilities."

Great Lakes Ore Boats Work Overtime

Great Lakes ore carriers are off with a rush this year to pile in all the ore possible before steel labor contract expiration.

Tonnage carried to June 1 was a whopping 15 million tons or almost four times the leisurely 3.9 million tons carried during the same time last year, says the American Iron Ore Assn., Cleveland. Start of the season was about two weeks later than normal this year due to heavy ice, but 230 boats, 93 pct, are in service compared to a top of 180 last year.

Using It Up — Ore is being chewed up at a high rate too. This year there are 243 blast furnaces in operation out of 276, compared to only 151 at the same time last year. Consumption of ore to May 1 in the U. S. and Canada was 44.6 million tons compared to 28.6 million the same time last year. In 1957 it was slightly higher at 46 million and stocks on hand had dropped to 27.2 million due to the 1956 strike. Stocks on hand this year were 37.7 million tons as of May 1 compared to 28.6 million a year ago.

Bulk of the increase this year has come from the industry's traditional mainstay—the Lake Superior district. Foreign ore, excepting Canada, at 6.6 million tons this year are only slightly ahead of the 6.2 million same time last year, out of the total shipments of 16 million this year against 11.8 million last year.

More Money for NASA

The nation's new civilian space and flight research agency is going to have close to a half-billion dollars in the new fiscal year with which to continue developing new rockets to put a man into space.

The National Aeronautics and Space Adm. now has Senate approval for a $485.3 million budget for the 12 months beginning July 1. This is some $5 million more than approved by the House.

Administration Will Get Its Defense Money

Plenty of money to support the Administration's new military spending will be voted by Congress this year.

Probable amount in the basic national defense money bill now before Congress will be around $39 billion. To this later will be added construction funds, boosting the total to a probable $40 billion-plus.

This result was anticipated as the Senate awaited receipt from the House of the measure containing defense funds for the next 12 months. While approximately $39 billion seemed to be enough in new funds to suit the House, the Senate is expected to consider raising the amount.

More—It's appropriate, one veteran member of Congress reasons, that the Senate is known as the upper house. They live up to this title by upping the House-approved money bills, he says.

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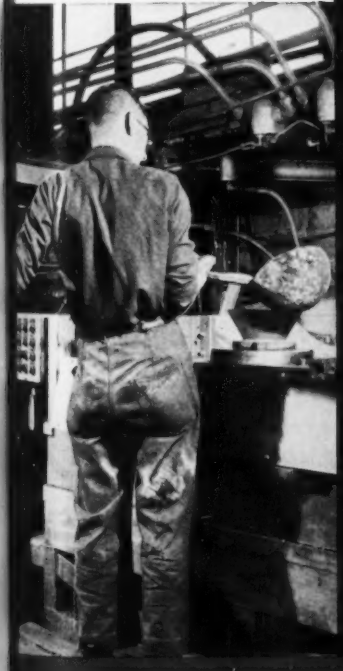

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Dr. Michael Ference, Jr.

Man in Touch With the Future

Most new products don't just happen. They have their origin in basic research.

Dr. Ference, head of Ford's scientific lab, is working years ahead of today's technology.

DR. FERENCE: An undreamed of standard of living ahead.

▪ Ford Motor Co.'s Dr. Michael Ference, Jr., works in the future as most of us do in the present.

In his job as director of Ford's top-rated scientific laboratory at Dearborn, Mich., he is responsible for basic research in the physical sciences. Visualizing the products men will be using in 10, 20, or 50 years and then organizing research along these lines is all part of today's work for him.

Big Changes Ahead—Dr. Ference points out that science has barely scratched the surface of man's potential knowledge of his world and universe.

Despite our seemingly advanced technology of today, he predicts that a century from now historians will look upon the developments of our age as we look upon those which introduced the industrial revolution 100 years ago.

Says Dr. Ference: "We are on the threshold of major scientific advancement that will elevate man's standard of living to undreamed of heights."

Lab Gains Stature—Dr. Ference's part in research might be classified as "unique" in industry. Aside from his job of organizing and directing Ford's research programs, he is concerned with establishing the company as a leader in research—contributing better products and a better tomorrow for all.

Because of his efforts and those of Dr. A. A. Kucher, now Ford's vice president, engineering and research, the laboratory already has attained a reputation for research of the highest order in metallurgy and physics.

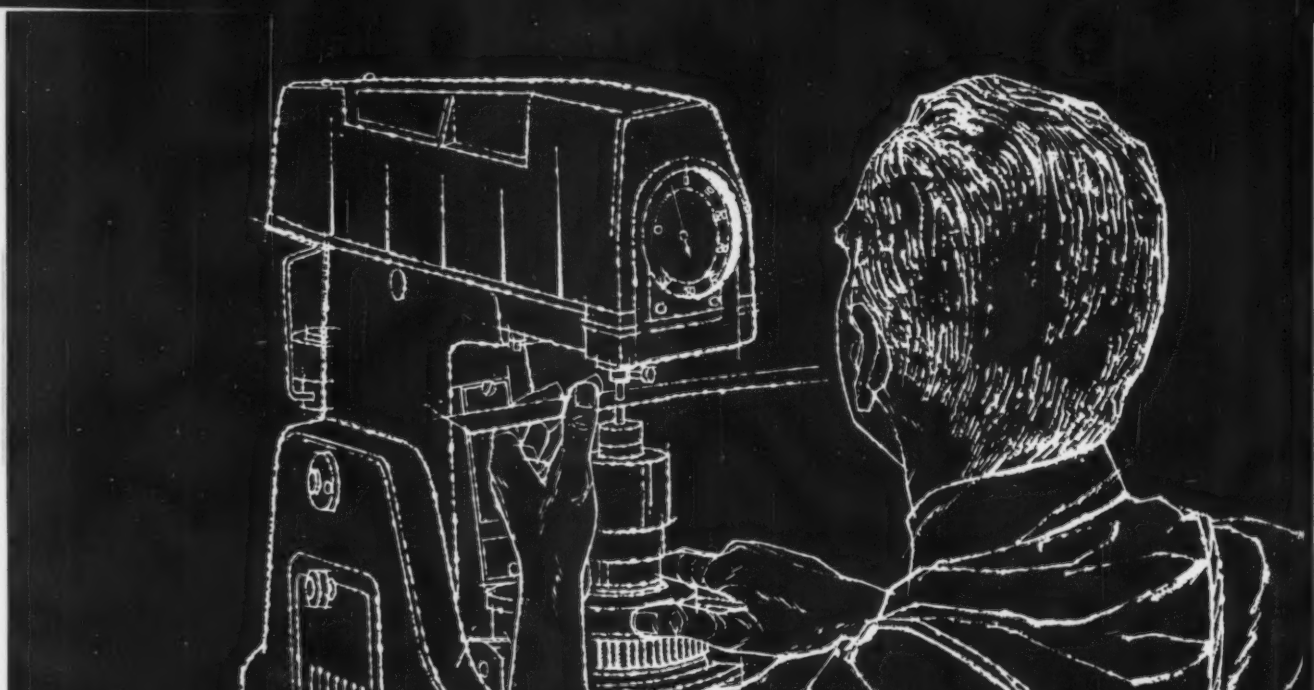
Two of the more recent developments to come out of the laboratory: Titanium-carbide tool tips that outlast tungsten carbide and ceramic tools, and an ultra-high strength steel with tensile strengths of "more than 400,000 psi."

A Former Teacher — Born in Whiting, Ind., 47 years ago, Dr. Ference earned three degrees at the University of Chicago. He taught there for 10 years, and organized the school's laboratories for hydrodynamics and upper atmosphere research.

In 1946, he joined the Signal Corps Laboratories and used V-2 and Aerobee rockets to help solve high altitude atmospheric problems. He went on to become technical director of the Evans Laboratory, Belmar, N. J.

In 1953 he joined Ford Motor Co.

Plenty to Do—Dr. Ference has numerous other projects to keep him busy. In addition to his family (five children), he serves on several National Academy of Sciences and Government advisory committees. Recently, he was elected to a four-year term on the board of governors of Wayne State University in Detroit.



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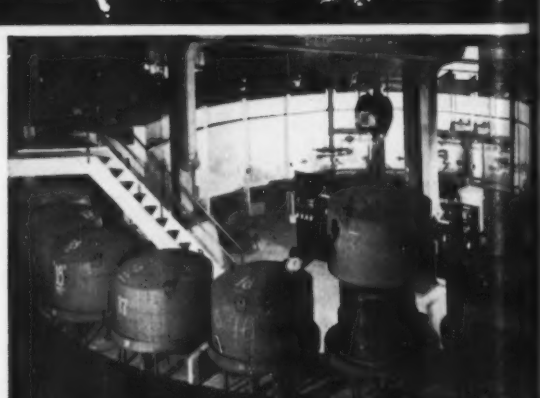

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Doubts Raised By Small Cars

To old timers in the auto industry, the small cars represent a retreat from a tradition that has been successful over the years.

But many both inside and out of the industry believe a change has to be for the better.

▪ The next few months will be a period of uneasiness for the auto industry as it awaits the coming of the new "small" cars. And among the group of industry leaders are many who feel they can't win anyway.

The reasoning is easy to grasp. Decisions to go small, or light, were decisions to retreat from the philosophy that has dominated Detroit thinking for decades: Make them bigger, flashier, with more extras—and more profits.

Profit Margin Narrows—Regardless of how automakers stress their well-known ability to manufacture at low cost, the profit on a small car with fewer refinements and extras will not be the same. It will take a greater volume to turn out the same profit.

And where is this volume coming from? Will it be from recovering markets lost to foreign cars? Will it be from a greater number of two-car families? Will it be from people who hesitate to buy any car because of cost? Will it result in a shorter trade-in interval?

Used Car Factor—And, something the man who trades in his old car and the dealer ponder with equal misgivings: What will happen to the used car market?

One thing that has helped morale in executive levels is the apparent fact that not too many prospective buyers are holding off until they see the small cars. But on the other hand, maybe they don't care.

There are also a number of effects to be felt among auto suppliers. What kind and how much trim will the small cars have? Will the market for sheets be hurt? What about the aluminum engine?

Room for Ingenuity—There is no doubt that among some single-minded automakers the decision to go to the small cars was a real defeat. However, to some of the younger group, which is now beginning to dominate the industry, the entire industry is likely to be more flexible and afford more opportunity for ingenuity, now that the inevitable break with tradition has been made.

Actually, the internal agony in Detroit's executive suites is probably overdone. No great revolution is likely and change is bound to stimulate interest. It's probable that the entire economy will show a profit from the move.

Debt Rise Brings Cheers, Fears

▪ Since buying on time became socially acceptable, instalment credit has become one of the best measures of buyer confidence.

Right now, consumers are extending their credit at a rate faster than any time since the fall of 1955, when the big boom was gathering steam. While it means good business for salesmen of durable goods, it is also a cause of alarm for the money managers who tend to view with alarm too fast an increase.

Contrast to Last Year—The gain of $423 million in outstanding credit in April raised the total instalment credit to $34.45 billion outstanding. This is up about $1.6 billion from a year ago, when buyers were cutting down their debts, not extending them.

It should be no surprise that durable goods accounted for most of the increase. Outstanding auto loans jumped $220 million, adjusted. However, in spite of the gains in auto paper, auto loans are still not as large as in the 1955 boom period.

Money Tightens—At that time, increase in auto paper ran as high at $400 million a month.

However, the sizable gains in instalment credit are a factor behind the tight money policy that is now gaining strength in the Capital. (See Washington, p. 111.) If money is made any tighter, continued gains in outstanding instalment credit may be slow in coming.

Service Costs Raise Cost-of-Living Index

You can blame service costs more than manufactured products for a lot of the creeping inflation.

The latest climb in the Consumer Price Index (0.2 pct in April) is attributed entirely to items of a service nature. The Bureau of Labor Statistics reports higher prices for transportation, medical care, recreation, and personal care.

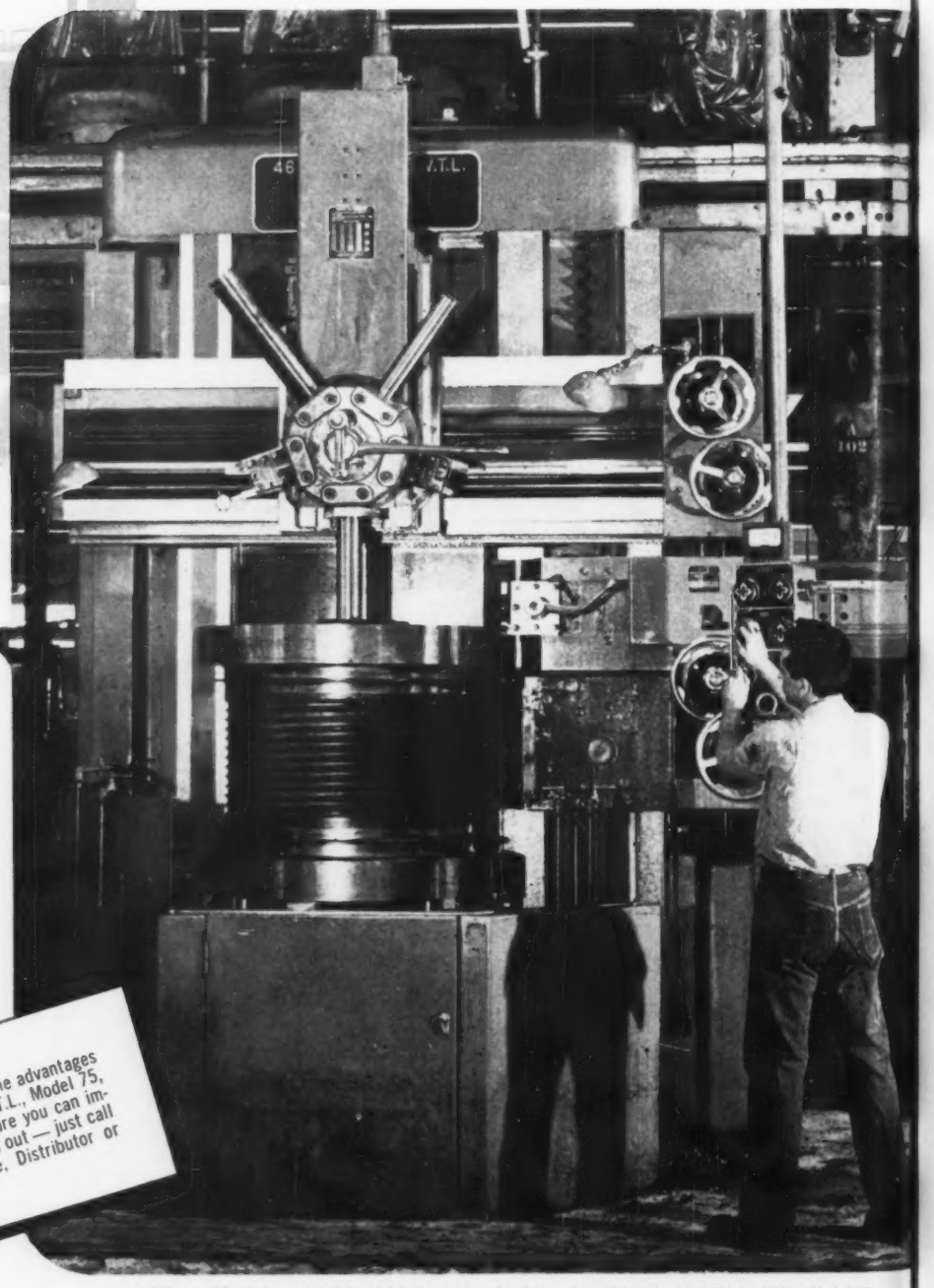
Commodity prices, on the other hand, were unchanged except for a slight decline in food prices.

For the record, the BLS returned to the record high level of 123.9 in April.

It Pays To Replace

An analysis of cost records at Philadelphia Gear Corporation, Philadelphia, Pa., shows, according to Mr. John Walker, Shop Foreman,

"A savings of up to 30% in overall production over our older 42" Bullard V.T.L. with our 46" Cut Master V.T.L., Model 75."



This saving is accredited to the following built-in features of Cut Master, Model 75:

Greater rigidity and solid construction – allows heavier cuts.

Greater accuracy with accurate finishes – reduces spoilage.

Simultaneous cutting with turret and side head – reduces machining time.

Ease of operation with Pendant Control – reduces operator fatigue.

Low maintenance cost – less down time.

One shot lubrication system – assures adequate oil to all parts of the machine.

BULLARD

Unless you are now employing all of the advantages offered with a Bullard Cut Master V.T.L., Model 75, to your machining jobs — chances are you can improve your production. Why not find out — just call your nearest Bullard Sales Office, Distributor or write

4,000 pound Drum for gate hoist which is bored, faced and turned on 46" Bullard Cut Master V.T.L., Model 75.

THE BULLARD COMPANY BRIDGEPORT 9, CONN.

Auto Output Highest Since 1955

But Rising New Car Inventories Cause Uneasiness

Automobile production in May continued the fast pace of preceding months.

Near-record inventories, however, are making some dealers wary.—By H. R. Neal.

▪ Spurred on by the return of a spring sales surge for the first time since 1955, assembly plants turned out 546,746 passenger cars in May —highest for the month since the industry produced a record 724,480 cars in May 1955.

While well under the May record, the output figure was nonetheless up substantially from the 349,615 units produced a year ago.

June Prospects—In the first five months of the year, U. S. automakers assembled 2,725,910 passenger cars. A year ago the figure was only 1,905,160 units. And June production is expected to continue above the 500,000 unit level. This will boost the six-months production totals above 3,250,000 units.

With the lone exception of Buick, all makes of cars helped push the May production figure to its lofty heights. Ford Div. showed the largest unit increase—to 143,841 units compared with 75,650 for the 1958 month. The total was only a few production hours short of matching Chevrolet's output of 144,445 units in May. A year ago Chevy turned out 113,639 units.

Sales Derby Is Close—Ford still trails Chevrolet in production for the first five months—683,227 to 738,033 units. However, a year ago Chevy's production lead was even greater—601,123 to 433,932.

And the sales race is reportedly even closer between these two. Chevy led in sales in January and February, but Ford led in March and April. If either establishes a commanding lead in May and June, that could mark the end of this year's sales derby. Otherwise, industry observers believe it will be a down-to-the-wire race.

Third Place Battle—Plymouth is still in third place in production with 49,404 units, compared with 32,125 a year ago, and a five months total of 204,922 units against 166,756

Economy With a Touch of Luxury

SIMCA'S TOP MODEL: The four-door Simca Elysee sedan is the French automaker's answer to those who want economy and luxury, too. Chrysler will begin importing this new model June 26. It will be added to eight other Simca models on sale in the U. S. The body is all-new, has a panoramic windshield.

last year. But it is meeting unexpectedly strong competition from Pontiac. Pontiac's May output of 43,620 units (15,630 last year) boosted its total to 200,971 units, nearly double the 106,188 units produced in the same period of last year.

General Motors' passenger car production for the year now totals 1,325,260 units, up from 1,045,241 in 1958. For the 5 months period, even Buick's production is ahead of last year—123,198 to 116,928, but the division's May production trailed last year 17,086 to 17,578 units.

All Producers Gain—So far this year all Ford divisions have produced 788,067 passenger cars compared with 508,915. Chrysler divisions are ahead of last year's production pace by 356,342 units to 260,203.

The independents continue to chalk up production gains. American Motors' May production of 38,473 units was more than double the year ago figure of 18,999 and boosted its January-May total to 178,940 compared with 74,531 last year.

Studebaker - Packard assembled 12,371 cars last month, compared with 3377 last year, and raised its total to 77,301. Total output of Packards and Studebakers for the same 1958 period was only 16,270 units.

Are Inventories an Omen?—But the high production levels, indicative of the industry's general optimism, have also given rise to some pessimistic speculation. New-car inventories of domestic passenger cars are estimated to be in excess of 900,000 units. The record of 906,000 was reached on March 1, 1956.

Some observers believe they will climb above 1,000,000 units by the first of July. Added to inventories of U. S. built cars are 100,000 or so foreign cars, so the present total inventory is already above the 1,000,000 unit level.

But Nobody's Worried—Industry sales executives profess not to be alarmed at the high inventory, and dealers don't seem to be clamoring for production cutbacks. The feeling seems to be that a strike is a foregone conclusion in the steel industry and that it's better to have cars on hand than not to be able to get them later.

No one seems to be worried—yet, about being unable to sell the cars. However, dealers have become cautious in appraising the effect announcements of forthcoming light cars will have on their sales. And the impression gathered from talking to auto company personnel is that the automakers aren't sure either. The question: How many buyers will defer purchases until the light cars appear later this year?

June Will Tell—If June sales follow the pattern of the past two months and show strength, storm clouds aren't likely to develop. If the sales pace doesn't pickup appreciably, the cry of over-production is apt to be heard again.

Automotive Production

WEEK ENDING	CARS	TRUCKS
June 6, 1959	127,738	27,705
May 30, 1959	117,372	25,419
June 7, 1958	73,696	16,191
May 31, 1958	66,574	15,038
TO DATE 1959	2,853,709	564,147
TO DATE 1958	1,978,606	392,822

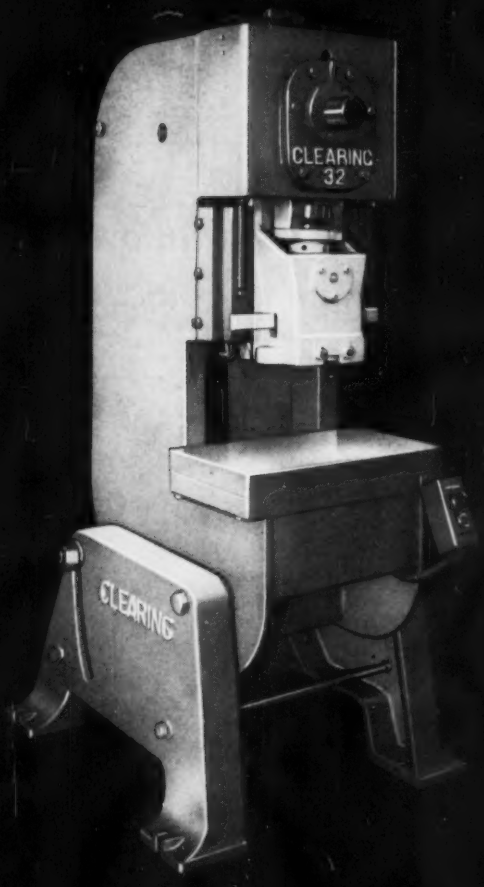
*Preliminary Source: Ward's Reports

The Bull of the Woods

Checker Starts Up Superba Production

Checker Motors Corp. went into production this week with its "Superba" four-door sedan, a family-car version of its taxicab. Production and introduction of the vehicle had been postponed several times in the past.

Factory-suggested list price is $2,541 including the federal excise tax but excluding state and local taxes and transportation. Initial production goal hasn't been revealed, but it is expected to be considerably below the company's capacity as it feels out the market. In the past year the company has expanded its production capacity from 35 units per day to 200 units per day.



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Torc-Pac presses are available now in capacities of 22, 32, 45 and 60 tons—in high speed ranges, too. Get in touch with Clearing for the full story.

Clearing division of U. S. Industries, Inc. manufactures power presses of all types, Clearing-Axelson and Clearing-Harrison lathes, dies and special tooling, and special equipment for the aircraft and missile industry.

Write for further engineering facts on Clearing's line of Torc-Pac O.B.I.'s.

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Make Cincinnati your first choice for equipment of this type. The Special Machine Division is ready to serve you.

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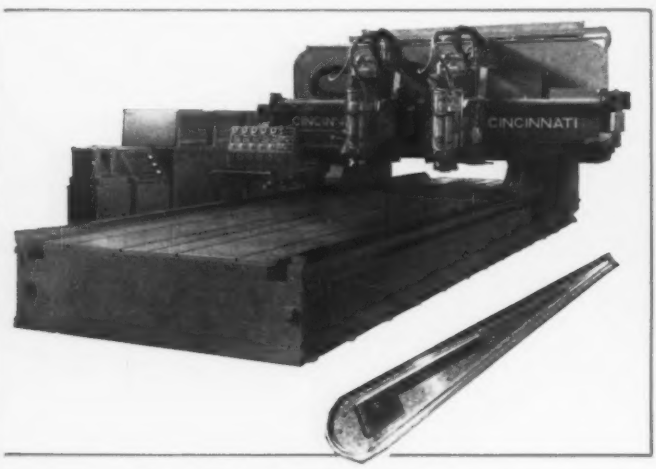
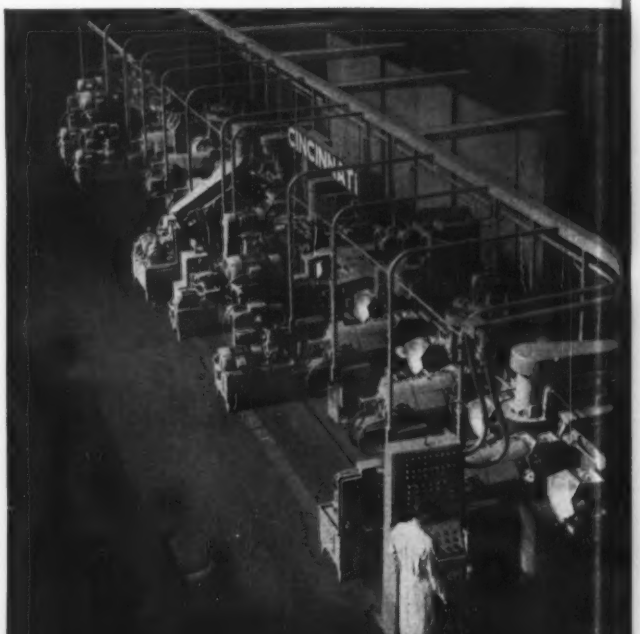
The Cincinnati Milling Machine Co., Cincinnati 9, Ohio



Large Numerically Controlled Milling Machine, developed and built by the Special Machine Division to mill aluminum aircraft components. Many parts of this type, one of which is illustrated, are milled in 1/5 the time usually required. The machine is a gantry type, having fixed table measuring 8 ft. x 30 ft.



CINCINNATI 26-Station Unit Type Transfer Line. This efficient production line automatically mills, drills and bores transmission cases in 33 operations; inserts two bushings; banks excess parts; transfers the castings from one station to the next. Features include unit construction; one station for future engineering changes; complete static electrical control. Accuracy and finish obtained are excellent. The line cycles at the rate of 137 per hour.

Below: **CINCINNATI Horizontal Hydro-Broach Machine,** typical of the many designed and built for the automotive industry to broach cylinder heads and blocks. The machine illustrated broaches cylinder heads on the top, joint face and two manifold pads each cycle. Ram speeds are adjustable, from 100 to 200 fpm; electro-mechanical drive; 300 hp. Production: 112 heads per hour.

SPECIAL MACHINES • VERTICAL AND HORIZONTAL BROACHING MACHINES • COMPLETE PRODUCTION LINES

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SPECIAL MACHINE DIVISI

Learn to Live With Tight Money

It's Almost Certain To Be With Us for a While

Ike's critics in Congress say the high cost of borrowing is firing up inflation.

But the Administration is determined to discourage over-expansion.—By G. H. Baker.

▪ Tight money is here to stay. The latest round of increases in interest rates probably will remain in effect for many months to come.

Cost of borrowing money—both to business firms and individuals—is now at record highs. The Eisenhower Administration claims stiff interest rates are necessary to discourage "over-expansion" on the part of businessmen, home owners, and automobile purchasers.

Rates Won't Go Higher—There's a small measure of comfort to be had in the likelihood the interest rates are probably now at their peak. It is doubtful that the Administration will be bold enough to nudge rates any higher than they are now. (Commercial banks now pay 3½ pct to Federal Reserve Banks. The borrowing public pays much more than this, of course.)

But it is extremely unlikely that any softening of the rates will come about soon. Although the Federal Reserve Board is careful not to show its hand regarding its future intentions, fiscal insiders here say it is unlikely that the rates will be eased for at least six months.

Critics Abound—There's plenty of opposition to the new rates within Congress, as well as from borrowers.

Critics in both the Senate and the House claim the Administration is firing up inflation, not quenching it, by jacking up the cost of borrowing. If the volume of borrowing does not slacken off under the new rates, borrowers will be squeezed and the banks will reap still greater profits from the higher rates, it is pointed out.

Deficit Spending Blamed — The new rates, authorized by the Federal Reserve Board in late May, push the cost of borrowing back to the former all-time high level of August-November 1957.

Some congressional critics of tight money point out that if the Administration is sincere about taking the steam out of inflation it should stop spending more dollars than it takes in.

Old Soldiers Fade Away—Or Do They?

▪ Maybe too many military men are stepping from service posts into jobs with defense contractors, some congressmen are thinking.

The question whether defense suppliers are hiring numbers of retired senior officers to fatten up their military sales has arisen in Washington once more. This time, two groups in the House are sizing up the question and taking separate approaches to it.

Four Firms Under Scrutiny—A House Armed Services subcommittee which is looking into weapons system management activities also is considering hiring practices. Hearings held by this group have centered on the prime contractor-subcontractor relationships of Air Force suppliers. Employment of retired officers by these suppliers is of related interest.

So far, the subcommittee has conducted management hearings on four principal suppliers in the aviation industry. Testimony from the USAF Air Materiel Command, scheduled for this week, will be followed by hearings concerning The Martin Co.

Colonels and Up—Congress does not yet have a clear indication of the number of retired servicemen who work for military contractors. But the House Appropriations Committee intends to get this information. The group has asked the Defense Secretary to submit a list of officers of the rank of colonel (or Navy captain) or higher who joined defense contractors after retirement.

The list is to be supplied before the Defense Dept. budget proposals come up for hearings in 1960. At that time, Pentagon witnesses will be questioned concerning Defense Dept. policy on the jobs taken by retired officers.

Law Sets Time Limit—On the subject of prospective employment, the Defense Dept. advises that an officer awaiting retirement should seek legal advice within his own service. If he is being hired by a defense contractor, he may find he is barred by statute from engaging in contract arrangements with his former service for two years after retirement.

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Efficient overhead materials handling pays off. You get more overhead storage space than fork truck handling provides. You benefit from aisles and work areas uncluttered by floor-type handling equipment. You can reach all areas under the crane, the full length of the runway.

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What's Ahead in the Space Age?

Expert Predicts Timetable for Next 10 Years

Many advanced space projects may be fact by the mid-1960's, says Dan Kimball, president of Aerojet-General Corp.

He foresees: Satellites with heavy payloads, space probes of planets like Mars and Venus, and even soft landings on other planets.—By R. R. Kay.

▪ Hopes of putting a man into space were brought closer by the recent spectacular rocket flight of monkeys Able and Baker.

Now a successful flight by a human is only a few years away, informed sources believe. But what else is ahead in the Space Age?

Practical Projects—The next decade will be the practical period, according to Dan Kimball, former Secretary of the Army and president, Aerojet-General Corp., Azusa, Calif.

During the next ten years he foresees:

Major satellites with payloads of several thousand pounds orbiting around the earth.

Deep-space and planetary probes to Mars and Venus.

Soft landings on planets and excursions of man himself into space.

Weather and communications satellites—to warn of storms and provide better, faster communications.

Fast Timetable — Mr. Kimball says all these objectives are technologically within reach. And he expects some of them will be achieved by the mid-1960's.

All we need, he says, to make a reality of fantastic science-fiction are two things: Rocket motors of enough power and exotic fuels which we're on the verge of discovering.

Beyond the 1960's—Peeking into the 1970's, he believes this period "will probably give us new insight into the nature of the universe. It may change many of the relationships of man to nature and man to fellowman that we now know."

The next 50 years will bring space flight of all kinds, Mr. Kimball predicts.

Metals and Weapons

Steel will play an important role in the future of aircraft, missiles, and space vehicles.

Some 50 to 75 tons of steel products, mostly alloy and stainless thin-gage sheet, will go into each B-70, North American Aviation's chemically fueled bomber.

Aluminum's Benefits — Aluminum, too, is valued for the advantages its lighter weight gives military equipment.

For example a $34.6 million contract for the Army's new T113 aluminum-armored personnel carriers went to Food Machinery and Chemical Corp., San Jose, Calif. (See photo.)

The tracked amphibious vehicle is a 9-ton replacement for the 20-ton steel carrier now in Army service.

Aluminum Reduces Carrier's Weight

HALF AS HEAVY: Hull of the Army's T113 personnel carrier (right) is formed of aluminum armor plate. By using aluminum the T113 is only half as heavy as the steel M59 (left) which it replaces. Lighter weight gives the T113 greater mobility and speed. It was developed by Food Machinery and Chemical Corp. which has the contract to make them.

Put strength, long life, silence into gears and couplings with CDF Celoron® molded plastics

WORK MIRACLES IN MACHINERY with this amazing golden phenolic material! Celoron gears help eliminate noise and reduce wear on mating metal gears. Even the roughest-used helicals last . . . and last . . . and last.

HIGH MECHANICAL STRENGTH. Typical Celoron strengths: tensile, 6,500 psi; flexural, 10,000 psi; compressive, 25,000 psi; shear, 8,500 psi. Dimensionally stable and readily machined, Celoron fills the bill where costly metal parts fail.

ELECTRICAL INSULATION VALUE. Celoron is a non-conductor with high electrical insulation value. It makes ideal mechanical-electrical parts. Celoron couplings effectively insulate motors from driven machinery.

CDF FABRICATION SERVICE. Let the plastics-fabrication and molding experience of CDF save you time and money, and assure you delivery of production quantities of CDF plastics and molded parts—on time and as specified. The CDF man can help you from the very beginning. See his phone number in the Product Design File (Sweet's). Or send us your print or your problem, and we'll return samples and technical literature for your evaluation.

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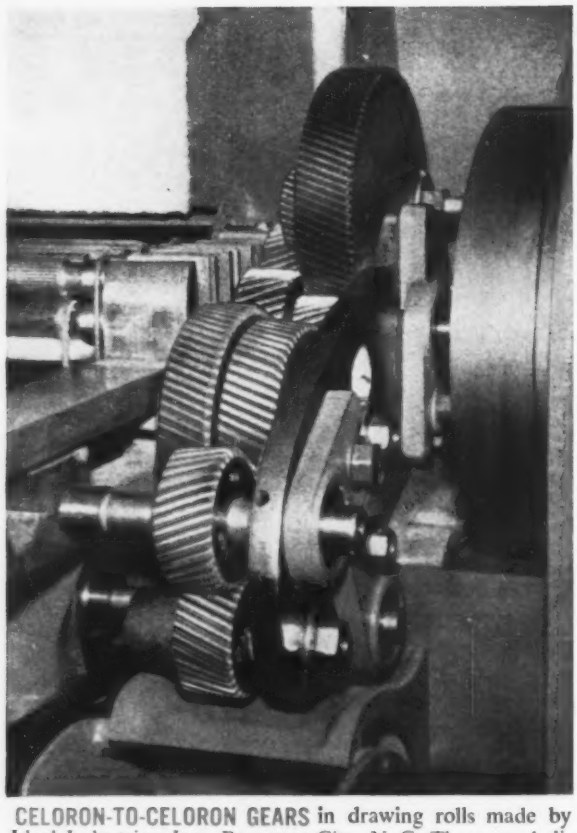
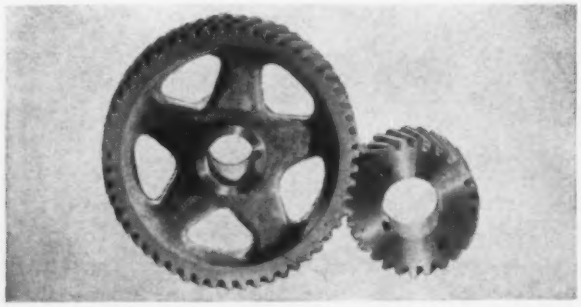


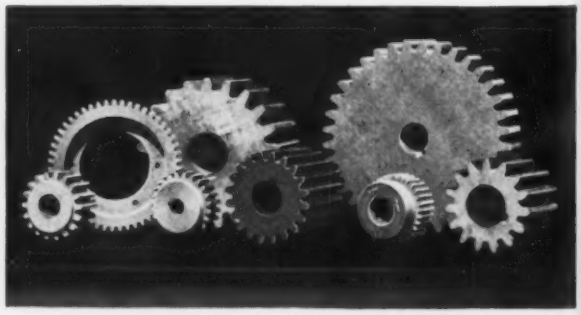
CELORON-TO-CELORON GEARS in drawing rolls made by Ideal Industries, Inc., Bessemer City, N. C. These are helical-cut gears—the toughest to machine, requiring the toughest material. Celoron is it. Other Celoron parts for this application are shown below, top right.

LOW-COST, EASILY-ASSEMBLED CDF Celoron flexible coupling transmits power smoothly, silently . . . insulates motor from machine . . . needs no lubrication . . . works vertically or horizontally.



CELORON-TO-STEEL combination makes this long-wearing timing mechanism for gasoline engines. Celoron gear absorbs shock, cuts sound to a minimum, holds timing longer.

PRECISELY MACHINED KEYWAYS help keep these Celoron parts silent and strong in the Ideal drawing rolls illustrated in top photograph. Note wide range of sizes and shapes.



STRONG, SILENT CELORON makes both drive and driven gears. In fact, many machine applications are 100% Celoron geared for light weight, elimination of excess play, long life.

Gearmakers' Business Is Better

April bookings were up a solid 9.1 pct over the previous month.

Members at the annual meeting get tips on possible tax savings.—By E. J. Egan, Jr.

▪ "April bookings in the gearing industry were at the highest level since May, 1957."

With this welcome bit of news, American Gear Manufacturers' Assn. president E. F. Borisch opened AGMA's 43rd Annual Meeting last week in Hot Springs, Va.

Business Is Good—Mr. Borisch, president of the Milwaukee Gear Co., told his fellow members that April bookings hit 255.6 on the AGMA index scale. The scale assigns a base value of 100 to the 1947-49 period. The April index represents a 9.1 pct increase over March in the industry's vital new business category. And in April 1958, with volume shrinking steadily, the index figure was only 153.2.

The current uptrend in business hasn't made the nation's gear makers any less cost conscious. Key executives from the leading companies turned out in force to hear a tax expert describe some prerogatives they may be entitled to under Federal tax laws.

Save on Taxes—Numerous areas in which businessmen might find legitimate tax savings were charted by Mr. Andrew F. Oehmann, member of the Washington, D. C., law firm of Lamb & Long, AGMA's legal counsel.

Mr. Oehmann's tax-saving divining rod probed a wide range of business setups and management practices. He discussed, for example, certain little-known tax benefits which can be achieved by both partnerships and corporations.

Here's One Way—It may be possible, he said, for partners and stockholders to buy new equipment and rent it to the businesses in which they're interested. It's one way to get more benefit from last year's ruling which allows a 20-pct extra depreciation on certain property up to a value limit of $10,000.

He cautioned his audience, however, that any tax-saving prerogative should only be sought with expert legal or accounting advice.

Save on Profit Sharing — Mr. Oehmann then switched to other tax-saving areas that management might consider, such as pension and profit sharing plans. "These days," he said, "it's wise not to overlook the advantages of setting up such plans. You owe it to yourselves and your employees to do it," he said, and cited several case histories to prove his point.

AGMA's valued Edward P. Connell Memorial Award for outstanding achievement and service in the gearing industry was given this year to Mr. Granger Davenport, chief engineer of Gould & Eberhart, Inc., Irvington, N. Y. Mr. Darle W. Dudley, a former recipient of the Award, made the presentation. Mr. Dudley is a gearing expert for the General Electric Co.

Newly Elected AGMA Officers

President
John L. Buehler
Indiana Gear Works, Inc.

Vice Pres.—Products
James F. Murray
Winsmith, Inc.

Vice Pres.—Technical
Folke Richardz
Westinghouse Electric Corp.

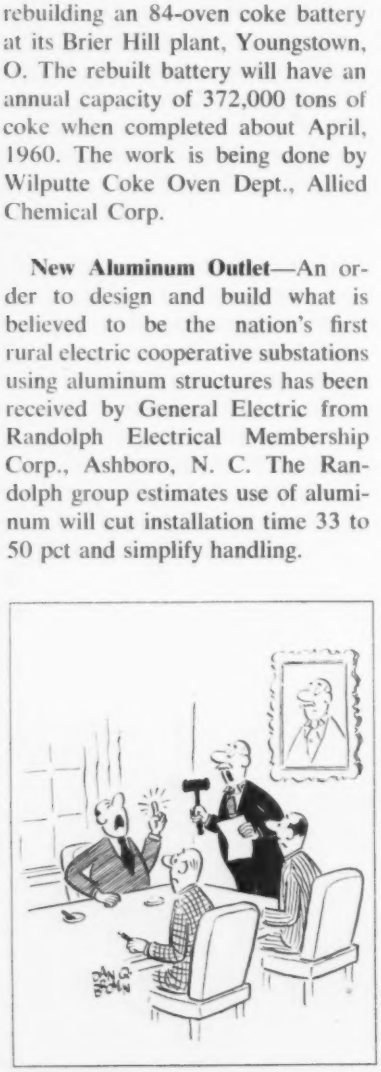
Treasurer
Charles F. Bannan
Western Gear Corp.

INDUSTRIAL BRIEFS

Agent Appointed—An agreement signed on May 29th makes McKay Machine Co. sole manufacturing agent for Mannesmann-Meer in the U. S. The pact covers original equipment and spare parts in the entire Mannesmann-Meer line of heavy-duty metalworking equipment. Both firms have offices in Youngstown, O., Mannesmann-Meer having moved general offices and engineering facilities here from the East last summer.

More Coke at Youngstown — Youngstown Sheet and Tube Co. is rebuilding an 84-oven coke battery at its Brier Hill plant, Youngstown, O. The rebuilt battery will have an annual capacity of 372,000 tons of coke when completed about April, 1960. The work is being done by Wilputte Coke Oven Dept., Allied Chemical Corp.

New Aluminum Outlet—An order to design and build what is believed to be the nation's first rural electric cooperative substations using aluminum structures has been received by General Electric from Randolph Electrical Membership Corp., Ashboro, N. C. The Randolph group estimates use of aluminum will cut installation time 33 to 50 pct and simplify handling.



"Anyone else care to question the financial report?"

Light Standard Transfer—Rockwell-Standard Corp., Coraopolis, Pa., has acquired the business of Kerrigan Iron Works, Inc., Nashville. This acquisition takes Rockwell-Standard into the new field of lighting standards for highway, streets, and many other uses. The business will be operated as a wholly owned subsidiary of Rockwell-Standard under the name Kerrigan Iron Works Co.

New NEMA Chairman—R. G. Liebmann, commercial manager, U. S. Electrical Motors, Inc., was elected chairman of the Motor and Generator Section, National Electrical Manufacturers Assn.

Defense Dept. Duty — John H. Rubel, 39, was appointed assistant director of defense research and engineering, U. S. Dept. of Defense. Mr. Rubel has been granted a leave of absence from Hughes Aircraft Co., Culver City, Calif., where he has been director of airborne systems laboratories.

Test Equipment in Demand — Tenney Engineering, Inc., Union, N. J., world's largest designer and builder of environmental test equipment, has received more than $1 million in new contracts. Ordering the new equipment are Hughes Aircraft Co., Aerojet General Corp., Sandia Corp., and Kollsman Instrument Co.

Electrical Contact—A proposed merger of D. S. Kennedy & Co., Cohasset, Mass., and Anchor Metals, Inc., Hurst, Texas, was unanimously recommended by a joint meeting of the boards of directors. The proposal has been submitted to stockholders for approval. Kennedy makes large microwave antennas. Anchor produces electrical transmission towers for electrical utilities.

Hagan Extends—Hagan Chemicals & Controls, Inc., will build a one-story, quarter-million-dollar addition to existing research facilities near Pittsburgh. Included will be a new pilot chemical laboratory, a mechanical research and development lab for pneumatic controls, and an electronics lab.

First Paydirt — Federal Pacific Electric Co. has been awarded a $1 million contract for oil circuit breakers by the City and County of San Francisco. The equipment will be among the first shipped from Federal Pacific's new high voltage switchgear plant at Santa Clara, Calif.

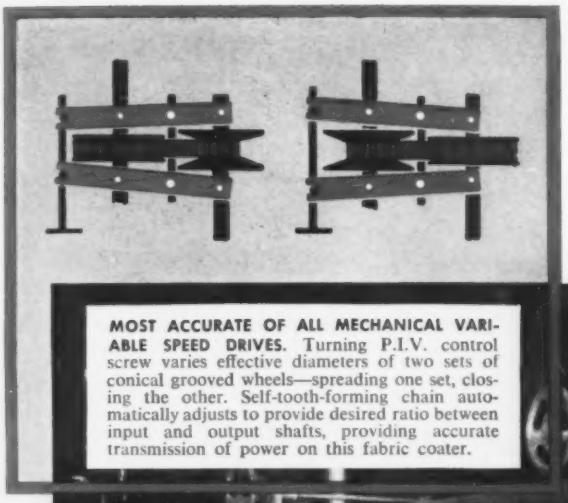
Government Buys Tractors — Minneapolis-Moline Co., Hopkins, Minn., has been awarded a $758,000 contract for industrial tractors by the U. S. Army Corps of Engineers. It received another order for tractors from the Minnesota State Highway Dept.

KC Outlet — Lennox Tool and Machine Builders, Lima, O., announces the appointment of English Brothers Machinery Co. as distributor for their line of shearing, forming, and piercing machines in the Kansas City, Mo., area.

Refractories Sale—H. K. Porter Company, Inc., has sold the land and three factories of the Laclede Works, Refractories Div., in St. Louis. The purchasing interests are taking title in the name of Ann S. Dattilo. Porter has been operating only one of the factories in recent months and will continue to operate this plant under a five-year lease agreement.

Roll Forming Debut—Solar Steel Corp. has entered the cold roll forming business at its new plant in Union, N. J. Solar, one of the nation's largest independent steel warehousing concerns, entered the roll forming field as the result of its purchase recently of the Mechanical Steel Tubing Corp., New York, N. Y.

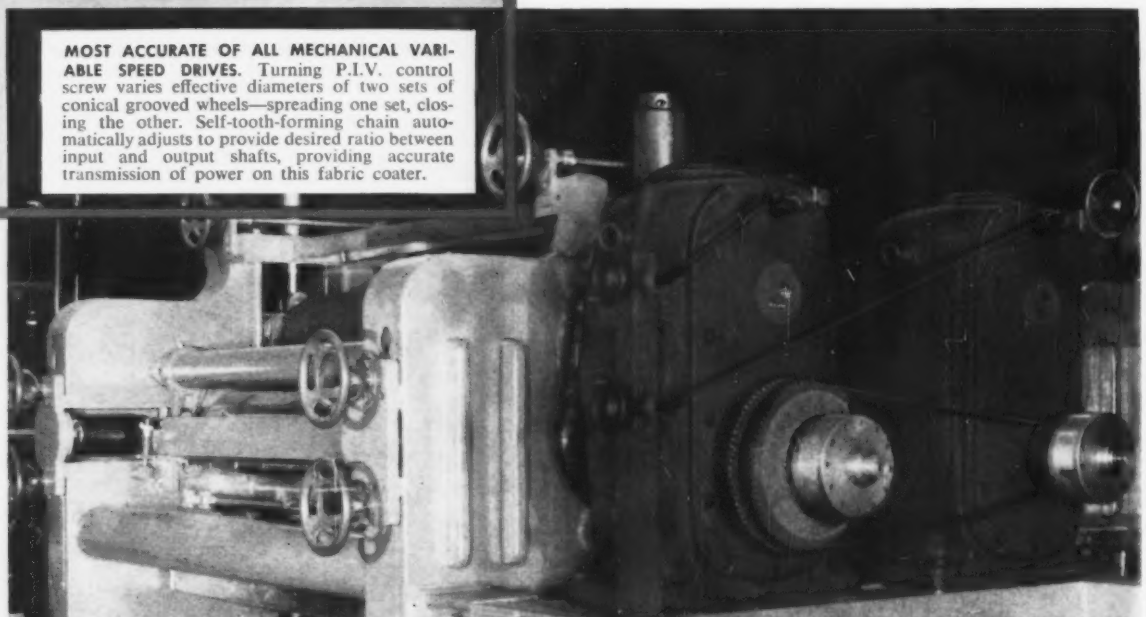
Lehigh Honors — Among recipients of honorary degrees at Lehigh University's 91st commencement exercises on June 15 will be Arthur B. Homer, president, Bethlehem Steel Corp.; Gwilym A. Price, board chairman, Westinghouse Electric Corp.; and Dr. Arthur S. Flemming, U. S. Secretary of Education, Health and Welfare.



In principle . . .

in performance . . .

MOST ACCURATE OF ALL MECHANICAL VARIABLE SPEED DRIVES. Turning P.I.V. control screw varies effective diameters of two sets of conical grooved wheels—spreading one set, closing the other. Self-tooth-forming chain automatically adjusts to provide desired ratio between input and output shafts, providing accurate transmission of power on this fabric coater.



for positive, infinitely variable speed control

. . . there's nothing like P.I.V.

Here's a variable speed drive that is truly unique. Unlike conventional designs, Link-Belt P.I.V. with its all-metal chain drive is *not dependent on friction* for transmitting power.

P.I.V. permits fast, easy speed changing too. You can select any speed in its range—find it instantly, hold it indefinitely. No bother stopping the drive.

Because Link-Belt P.I.V. (Positive, Infinitely Variable) drives are fully enclosed, atmospheric conditions can't affect their efficiency. They're made in 8 sizes, 16 standard types. Ask your nearest Link-Belt office or authorized stock-carrying distributor for Book 2274.

LINK-BELT

P.I.V. VARIABLE SPEED DRIVES

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World. 14,842

The Budd Co., Defense Div.—J. B. Darrah, appointed vice president and general manager.

Racine Hydraulics & Machinery, Inc.—J. E. Erskine, elected president; **G. B. Miller,** named executive vice president, and **J. E. Mohrhauser,** named vice president, operations.

Lewin-Mathes Co., Div. of Cerro de Pasco Corp.—**E. F. Schweich,** elected president.

H. K. Porter Co., Inc.—R. W. Christenson, elected a vice president.

International Steel Co.—W. D. Hamilton, elected chairman; **J. B. Igleheart,** promoted to president and chief executive officer.

Globe Hoist Co.—D. F. McCarron, named vice president, sales, Philadelphia.

Union Carbide Corp. — W. M. Haile, elected a vice president.

Screw & Bolt Corp. of America, Pittsburgh Div. — **H. G. Dacey, John Krause, Jr.** and **D. W. Patrick,** named asst. vice presidents, sales.

Lewis Welding & Engineering Corp.—C. E. Allison, elected vice president and treasurer; **E. W. Hollis,** elected vice president and general sales manager.

Universal-Cyclops Steel Corp.—W. D. Dickey, elected treasurer.

Harnischfeger Corp.—W. L. Carter, appointed treasurer and **J. H. Mezera,** controller.

Phoenix Steel Corp. — S. W. Richardson, appointed director, industrial and labor relations and personnel.

The Carpenter Steel Co., Alloy Tube Div.—**P. E. Kelly,** appointed manager, sales; **S. E. Doughty,** appointed manager, technical services, and **G. M. Stabler,** appointed manager, production.

Minnesota Mining & Mfg. Co., Coated Abrasives and Related Products Div.—**E. F. Goad,** promoted to marketing supervisor, coated abrasives and new products.

C. G. Hussey & Co., Div. of Copper Range Co.—**J. R. Lally,** elected president.

American Chain & Cable Co., Inc., Page Steel & Wire Div.—**J. C. Cassidy,** appointed Chicago district sales manager.

Linde Co., Div. of Union Carbide Corp.—**J. J. Dall,** appointed asst. general manager, electric welding.

The Youngstown Sheet & Tube Co., Indiana Harbor Works—**D. M. Lloyd,** named general superintendent, steel plant rolling and finishing mills, and **R. M. McCafferty,**

(Continued on P. 120)

Foundry Design Co. — J. M. Planten, named vice president and associate.

Republic Steel Corp. — H. C. Lumb, named vice president, legal and public affairs.

The Anaconda Co.—E. I. Renouard, elected vice president, western operations.

(Continued from P. 119)
promoted to superintendent, continuous butt weld tube mills; **C. W. White, Jr.,** named superintendent, bloom, billet, bar and skelp mills at Indiana Harbor.

Kaiser Aluminum & Chemical Sales, Inc.—R. F. Becker, appointed conduit sales manager.

Republic Steel Corp., Sheet and Strip Div.—**J. M. Kimbrough, Jr.,** appointed manager, sales.

Allis-Chalmers Mfg. Co., Defense Products Div.—**H. R. Hammond,** appointed general manager.

Foote Mineral Co. — W. F. Luckenbach, Jr., named general manager, Commercial Development Dept.

National Steel Corp. — R. L. White, named district sales manager, Philadelphia office.

Bethlehem Pacific Coast Steel Corp.—I. F. Kurtz, appointed asst. to the vice president, operations.

The Youngstown Sheet & Tube Co.—C. M. Horan, appointed general superintendent, basic steel operations, Indiana Harbor and South Chicago works.

American Standard, Detroit Controls Div.—**R. R. Ashley,** appointed manager, manufacturing, Stratford, Conn. plant.

Avco Corp., Lycoming Div.—**R. F. Howe,** named asst. plant manager, Stratford, Conn., plant; **Immanuel Lichtenstein,** named asst. to the president, planning.

American Hoist & Derrick Co.—H. M. Patton, appointed works manager, St. Paul, Minn., plants.

The Youngstown Sheet & Tube Co., Sheet and Tin Div.— **N. W. Tucker,** appointed superintendent, No. 1 Tin Mill Cold Reduction Dept., Indiana Harbor Works; **R. F. Spacek, Jr.,** asst. superintendent,

(Continued on P. 124)

STAINLESS STEEL

- **Quick Deliveries**
- **Technical Assistance**

You may know exactly what you need in Stainless Steel. In that case you'll appreciate the quick deliveries you can get from your nearby Whitehead Metal "Supermarket". We stock 716 sizes and items in 21 different alloys.

Stocks of well over 500 sizes of rod, pipe and tube, almost 200 items of sheet, thousands of fasteners and even five different sizes of a specialty item like super pressure tubing, make Whitehead a true "Supermarket" of Stainless Steel—no matter what your requirements.

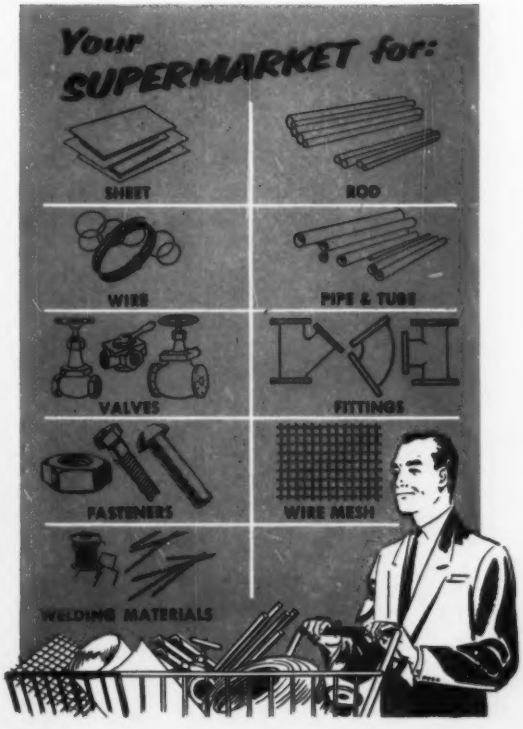
Since we stock all the principal corrosion resistant metals—Aluminum, Brass, Bronze, Clad Metals, Copper, Monel, Inconel and Plastics, too—we can and do give unbiased opinions on the right material to do the job. Anytime you need anything in the corrosion resistant line, you'll find it pays to call Whitehead first. Write for a free copy of our Stainless Steel Stock List.

Call WHITEHEAD METALS *First!*

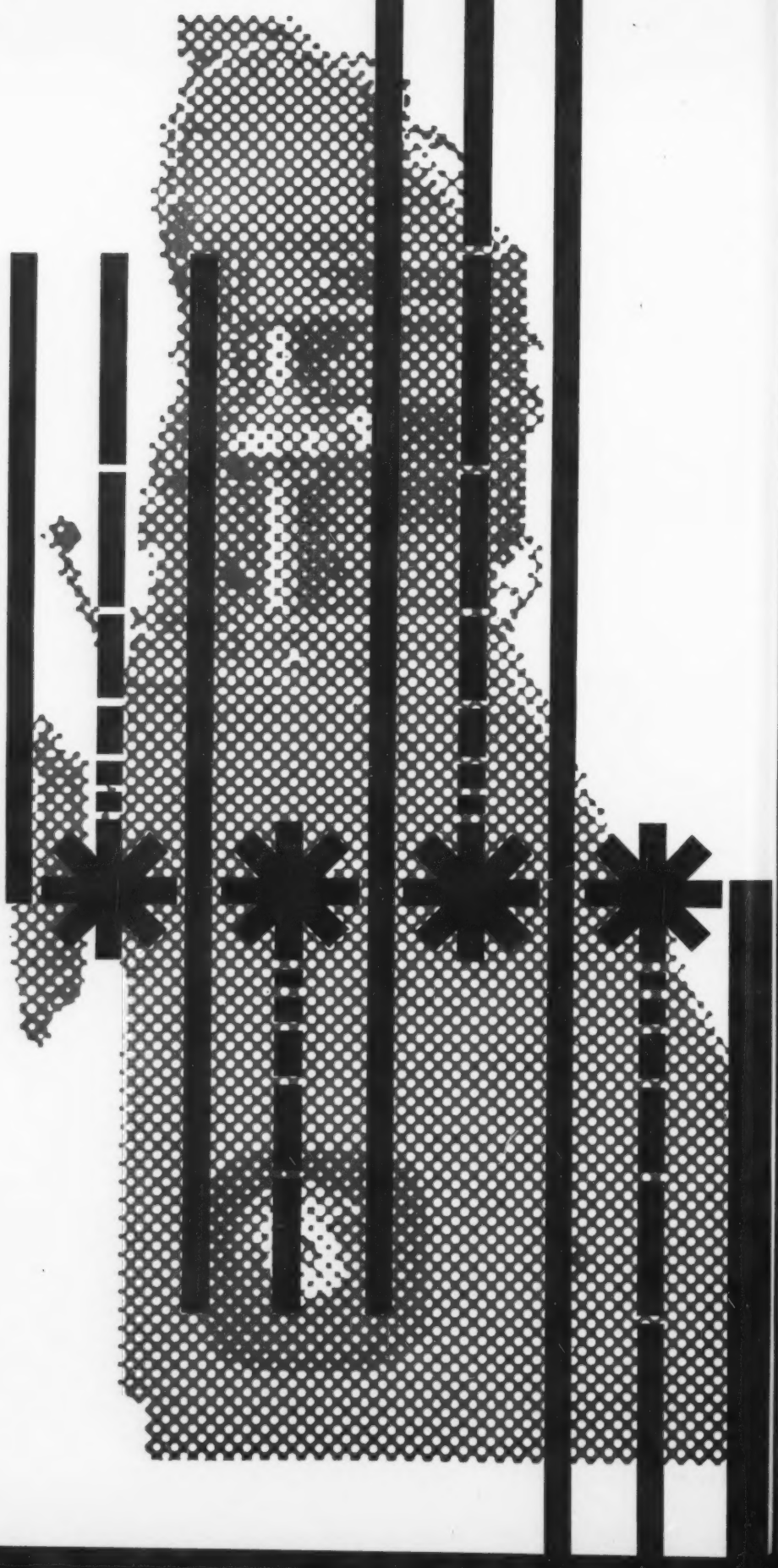
WHITEHEAD METALS, INC.

303 WEST 10th STREET, NEW YORK 14, N. Y.

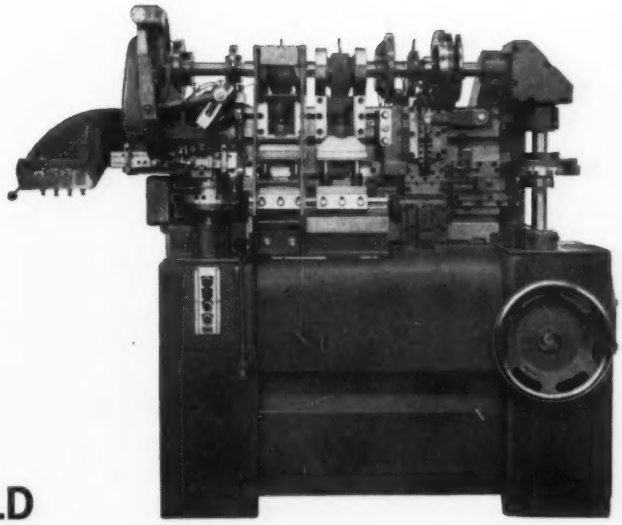
Other offices and warehouses: **PHILADELPHIA • BUFFALO • HARRISON, N. J. • CAMBRIDGE, MASS. • SYRACUSE • BALTIMORE • ROCHESTER • WINDSOR, CONN.**



EXCITEMENT



Once in a blue moon, a really exciting new production machine is developed . . . and this is it! It's the Torrington **Verti-Slide** which promises a genuine revolution in the production of just about everything in strip forming that is now being produced by progressively tooled presses. Single-handed, the Torrington **Verti-Slide** has already demonstrated its ability to replace as many as six presses in high speed precision production of complex parts. Cooler heads than ours are telling **us** that it's the most exciting new development in its field in half a century.



IN THE PRODUCTION WORLD

Write or call today for complete data—or a Torrington sales engineer.

THE TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT · VAN NUYS, CALIFORNIA · OAKVILLE, ONTARIO

(Continued from P. 120)

No. 2 Tin Mill; **P. J. Barliak,** asst. superintendent, Sheet Mill.

Crucible Steel Co. of America—D. A. Porco, appointed asst. to the president.

Olin Mathieson Chemical Corp.—E. H. Bellows, appointed director, personnel.

OBITUARIES

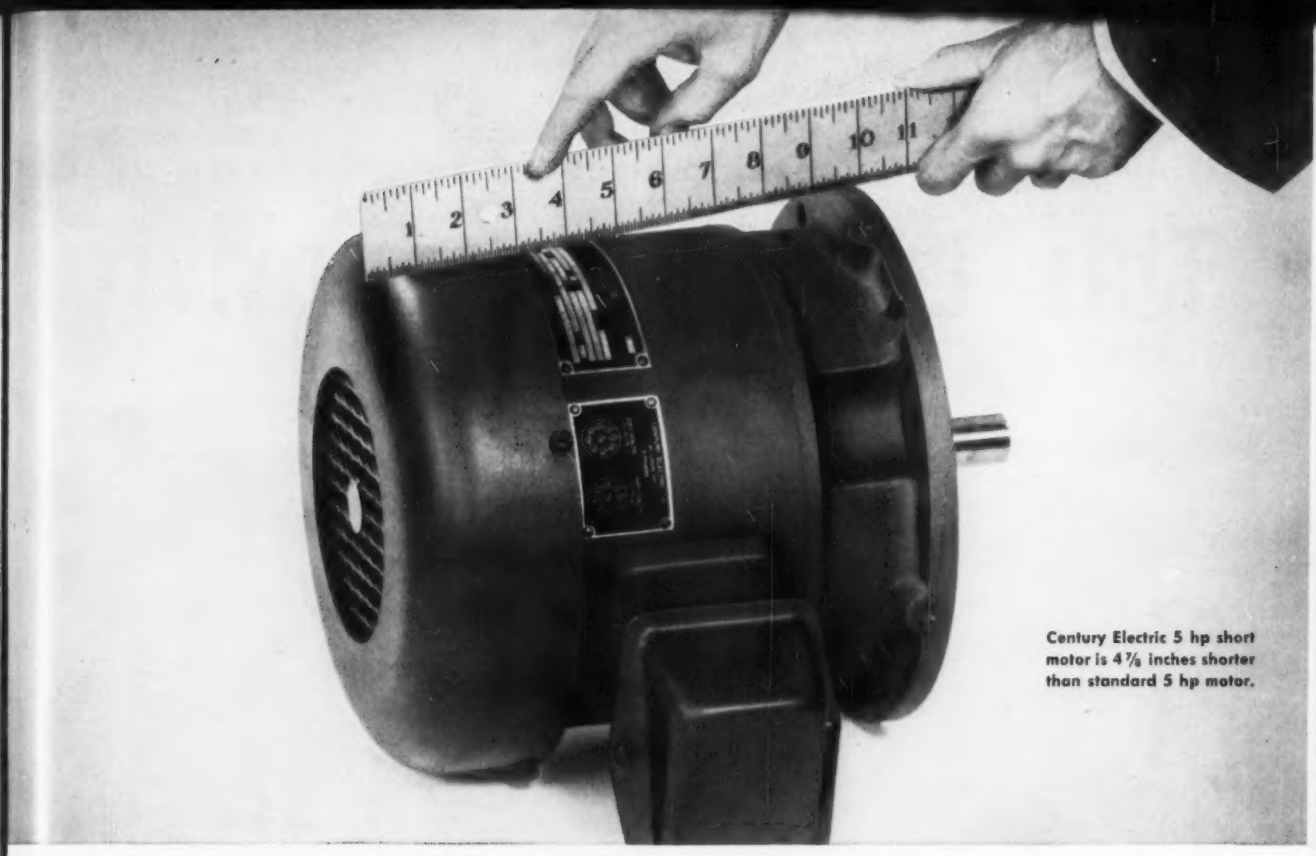
Lincoln Electric Co.—J. C. Lincoln, 92, founder of the company and **A. F. Davis,** vice president and secretary.

The Electric Storage Battery Co.—C. F. Norberg, 60, president.

National Malleable & Steel Castings Co.—G. J. Leroux, 77, executive.

The Producto Machine Co.—H. W. Hansen, 54, eastern sales manager.

Dearborn Gage Co.—Elmer Ellstrom, Sr., 72, founder of the company.

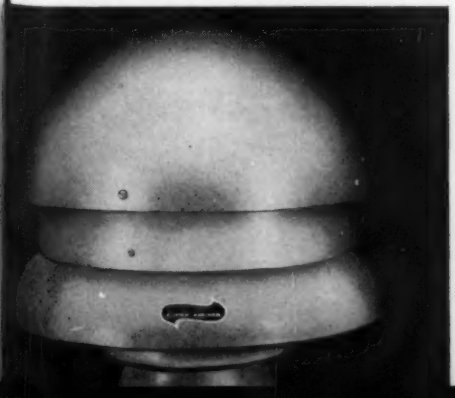


Century Electric 5 hp short motor is 4⅞ inches shorter than standard 5 hp motor.

This new Century Electric motor is up to five inches shorter

(above) Standard flange gives flexibility in mounting. Motor can be installed horizontally or vertically.

(below) This compact power roof exhauster is typical of applications for short motors.



You have greater product design freedom with the new Century Electric short motor. It is two and a half to five inches shorter, but has all standard integral motor features. Here are the benefits:

Save space and weight— Your product can be smaller, lighter, a different shape . . . because the new motor is up to 35% shorter and has less bulk and overhang. Means you also reduce handling costs—both in receiving motors and shipping your product.

Easy mounting— You can use this motor in place of any standard end-mounted motor because it has a standard flange. It can also be mounted horizontally, vertically, or at any angle. Its small size makes it possible to mount the motor in a variety of places on equipment.

Variety of applications— You can get the new Century Electric short motor in totally enclosed or open frames and in ratings up to 15 hp. You can use it on many applications such as machine tools, roof ventilators, pumps and centrifuges. And it has the same quality features and high standards of all of Century Electric's complete line—up to 400 hp.

More than a motor— This motor is the result of a continuing search for ways to meet industry's needs. Another reason why you get more than a motor from Century Electric.

For more information, contact your nearest Century Electric Sales Office or Authorized Distributor.

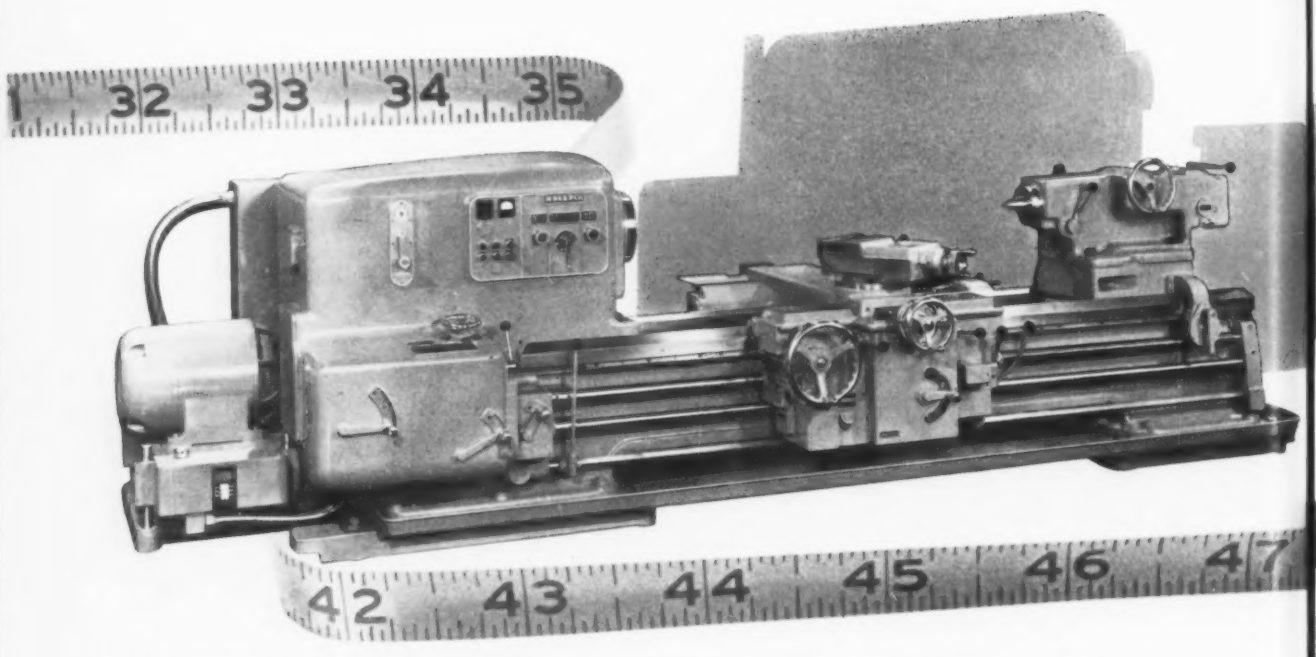
CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century 59-3

Only Another Monarch Series 90 can measure up to

This Lathe's productivity



Big work requires more than just a big lathe

Massive machine components and the necessary swing capacity don't fill the complete bill by far. The basic consideration is almost always greater production, therefore lowered costs.

You get this in the Monarch Series 90 Heavy Duty Dyna-Shift—an ultra-modern machine which will remove more metal at any speed than is possible on any other heavy duty lathes. Maximum production is assured because here is a machine that can be kept under full load during the entire cutting cycle. Major contributing factors design-wise are more machine output per unit of power input, less operator effort, reduced maintenance, ease of supervision. The Series 90 meets all these requirements as does no other heavy duty lathe — and the points discussed in this ad tell you why.

Production increases of 25% or more along with a similar improvement in tool life are a common experience for Series 90 users. There's the pay-off when you invest in the best—the cheapest in the long run. The Series 90 is available in three models ranging from 40″ to 48″ clearance diameter and 25″ to 36″ swing over the cross slide. Write for Booklet 1601.

THE MONARCH MACHINE TOOL COMPANY, SIDNEY, OHIO.

ELECTRICALS PLACED RIGHT

1. External main drive motor mounting and external electrical control mounting (either NEMA or JIC) for quick accessibility.

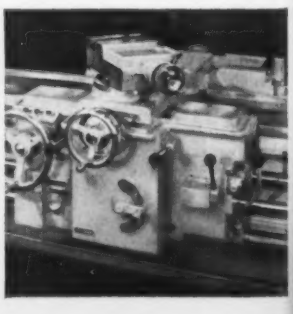
2. Motor mounted on hydraulic system sump also supplies power for hydraulic pump.

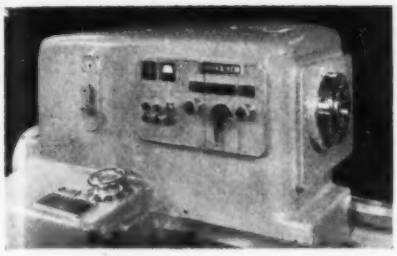
CONTROL CENTERED AT THE APRON

1. Electrically actuated power traverse, left or right, for fast carriage movement. Jogging for critical positioning may be accomplished any time desired.

2. Positive, cam controlled feed frictions. Application is such that machine never loses its chip under the heaviest of cuts.

3. All controls located to permit operation from a stand-up position—no stooping or stretching necessary.





HEADSTOCK WITH A BRAIN

1. 36 speeds—range 6 to 750 R.P.M.—ratio 1 to 125. Standard range low enough, high enough and with plenty of speeds in between to provide reasonably constant surface cutting speed on most work.

2. Operator works in terms of surface cutting speed. Machine automatically figures correct R.P.M. and sets up shift. Operator sets two dials—one for work diameter, the other for desired surface speed. A speed indicator always shows the R.P.M. in engagement.

3. Flip of a lever gives free spindle in a jiffy. And there is a generous 4 1/16" hole through the spindle.

4. Hydraulic brake and clutch are self-adjusting for wear. Being under automatic machine control regardless of load, operator needs not supply power for engagement.

MACHINE CONTROL—EASY DOES IT

1. Series 90 controlled by a three-position lever at the apron. A duplicate lever close to the headstock is provided for setup purposes. With this lever, work rotation may be started or stopped and jogging may be accomplished.

2. Shifting, an operation performed many times each day, is at fingertouch ease and speed. Hydraulic power does the work of clutching, braking, gear shifting and jogging.

COMPLETE AUTOMATIC LUBRICATION

1. Headstock, end gearing and gear box served by single system of the filtered, combination mist-splash type.

2. Apron lubrication system of the circuited, metered and filtered type also provides oil to carriage guide ways and cross slide bearings. There is ample lubrication during both power and manual longitudinal and cross feed.

3. Separate tailstock lubrication system.

PROTECTED GEAR BOX AND END GEARING

1. Both the gear box and end gearing are totally enclosed. Lubrication is kept in, dirt kept out, original accuracy maintained.

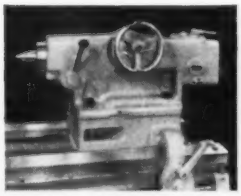
TOPS IN SAFETY INTERLOCKS

1. When machine is started, the brake engages automatically, preventing spindle rotation regardless of main control lever position.

2. No speed shift can be made with spindle rotating. More than anything else this preserves the original accuracy of headstock gearing.

3. Leadscrew and feed rod cannot be engaged simultaneously.

TAILSTOCK AHEAD OF THEM ALL



1. Either single speed or two speed range type available with dead or anti-friction center spindle. Sufficient mass, rigidity and spindle size (7" diameter) to support the heaviest of cuts.

2. Work piece expansion, due to heat, absorbed by heavy duty springs in the tailstock.

3. Handwheel located at front for convenience of operator when changing work pieces.

ADDED EQUIPMENT FOR ADDED PRODUCTION

1. Additional equipment in considerable variety is available for the Series 90 line. Consider, by all means, the advantages of the "Air-Gage Tracer," a means by which thousands of users have reduced costs substantially.

2. Ask for descriptive Booklet 1601 which not only describes the basic machine but the commonly used items of additional equipment and includes full specifications.

Monarch
TURNING MACHINES
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

INSTANT SUPERVISION

1. At a glance, supervisor may check (a) work diameter setting, (b) S. F. P. M. setting and (c) H. P. consumption. This makes it possible easily and quickly for him to assure full productiveness of the machine and the operator at all times.

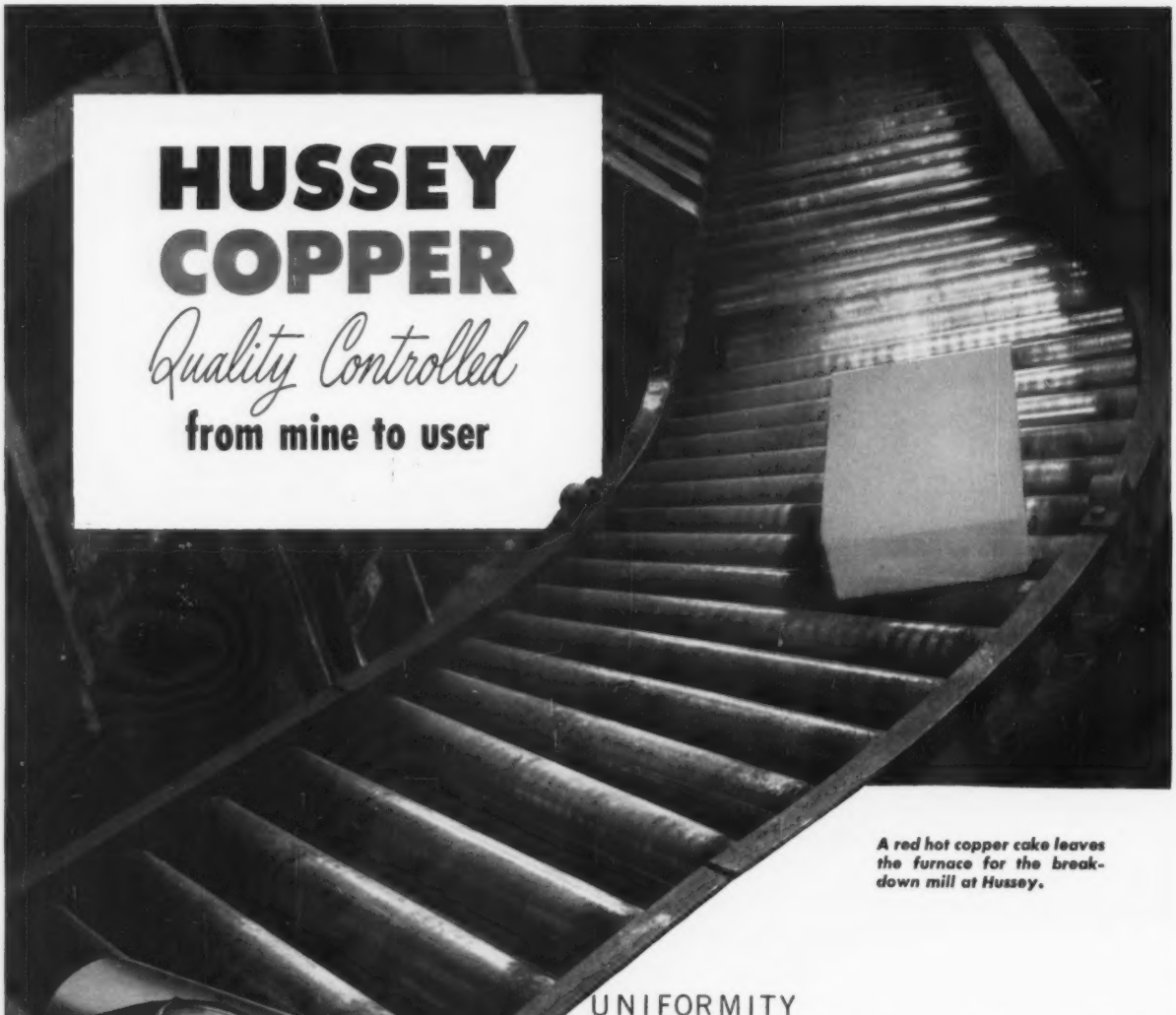
THE BED—FLAME HARDENED, ROCK-SOLID

1. All four bed ways flame hardened and precision ground to keep them factory-fresh for years to come.

2. Triangular bridge type girth construction throughout entire center section provides stability needed for heavy duty work.

3. Longer machines equipped with traveling rod supports which are automatically picked up and dropped off by apron.

4. Dual pump coolant system, with electrical control on apron convenient to operator, guarantees ample coolant exactly where and when it is wanted without long and unsightly hose strung over machine.



HUSSEY COPPER

Quality Controlled

from mine to user

A red hot copper cake leaves the furnace for the break-down mill at Hussey.

UNIFORMITY

Hussey constant quality controls produce a uniform quality in copper you can depend on in both physical properties and dimensional accuracy.

CONTROLLED TEMPER

Grain size and degree of temper is closely maintained to assure no significant variance from lot to lot or year to year.

MINIMUM TOLERANCES

Dimensional tolerances on length, width, thickness, straightness and flatness are held to the minimum at all times and produced especially to customer specifications.

FLAWLESS

The surface finish and internal structure of Hussey Copper is maintained flawless by constant inspection.

THE EXTRA INGREDIENT

Hussey Copper is produced by the unique combination of the most modern technology and the personal attention of skilled craftsmen. To be sure—make sure you order Hussey Copper.

COPPER
HUSSEY
BRASS

MADE IN U.S.A.
TO THE STANDARDS
OF AMERICAN INDUSTRY

C. G. HUSSEY & COMPANY

(Division of Copper Range Co.)

Rolling Mills and General Offices

PITTSBURGH 19, PENNSYLVANIA

Abrasive-Belt Shortcut Stresses Polish Before Forming

One of the fastest-growing ideas in finishing is abrasive-belt grinding and polishing of flat stock before forming.

It's a low-cost process to lift quality and cut overall finishing costs.

By R. H. Eshelman
Engineering Editor

▪ Taking a cue from the automotive and steel industries, more and more metalworking plants have found that it pays to prefinish material in the flat. With some care in handling and forming, you need little further polishing.

It's a way to sidestep costly manual deburring, grinding and polishing. What's more, there's equipment ready to do this job—either in small or large volume.

At least one builder, after an extensive design period, is expected to unveil a family of standard machines just for this work at the Industrial Finishing Show.

Proven Method — Automakers have gone into this prefinishing process on electroplated parts, from trim to bumpers. They blank out their parts. Then they prepolish on automatic machines with 6, 8 or 10 heads.

When the parts arrive at the finish desired, they go through a coating operation. The coat is baked on.

Then the parts move on through forming. With carbide dies and other equipment now available, draw marks and other processing imperfections are minimized. All that's necessary before plating is to do a little touch up here and there.

FINE FINISH: Pinch-roll machine imparts high polish to bronze door escutcheons in manual feed. Only minor touchup is needed after forming.

Solves Basic Problem—A most common problem in polishing is the scale imbedded in the surface of hot and cold rolled stock. The grinding head does this job and removes any other imperfections. Successive heads can then do the polishing.

With today's product refinements and upgrading of design requirements, more mechanical parts are becoming candidates for such treat-

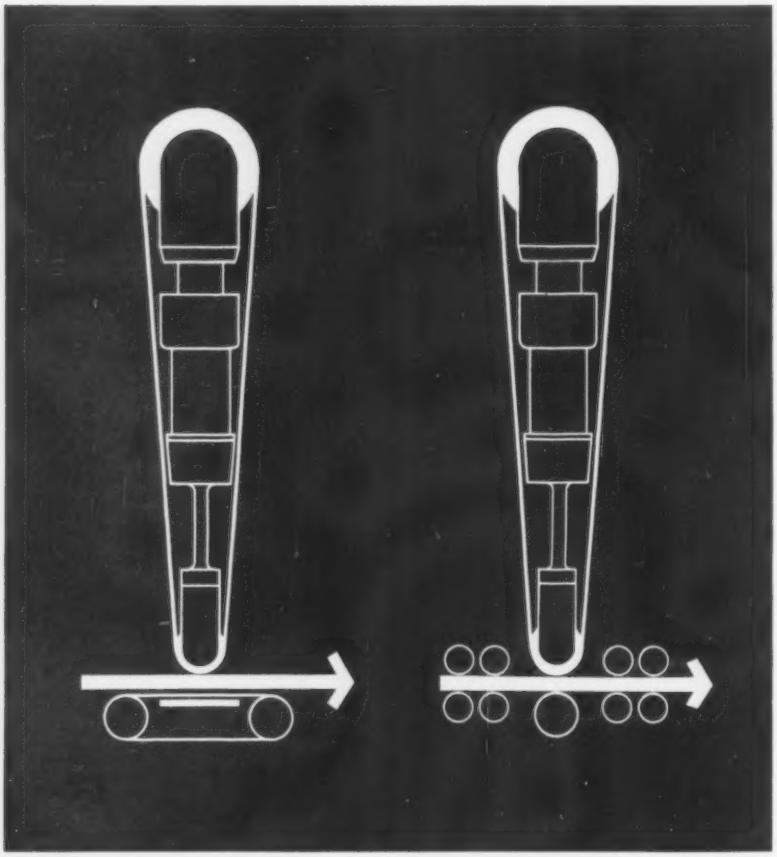
ment. For example, a spring manufacturer finds it's the slight surface imperfections that are guilty in most breakage.

Heat treatment seems to magnify these defects, causing premature failure. Remedy is to grind and polish the spring stock.

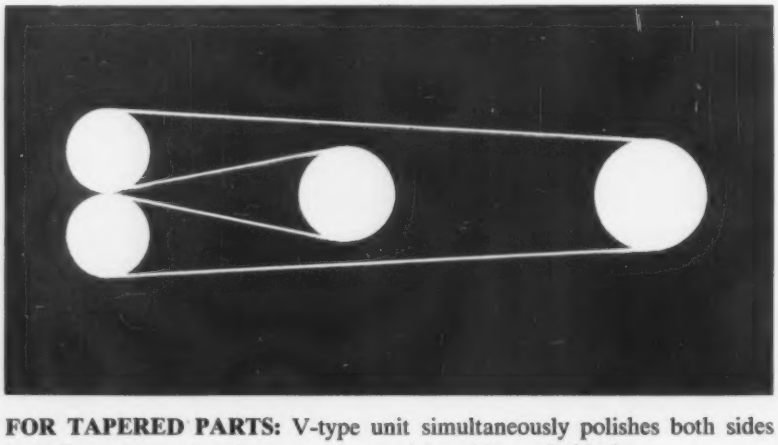
Variety of Materials—This type of abrasive-belt deburring, grinding and polishing works on a range of stock: bars, strips, coil, stampings, and finish surfaces of forgings, die castings and sand castings. You can set up virtually any flat surface for sizing, deburring, descaling, snagging.

A maker of glass fiber fishing rods uses this method of finishing tapered square blanks with special fixtures.

Other setups are handling printed circuits, switch plates, stainless steel strip, tablespoon blanks, door plates, formica and other plastics, marble, concrete, even rubber parts.



PRODUCTION SETUPS: Conveyor-belt type (left) handles miscellaneous parts with flat surfaces. Pinch-roll type (right) handles thin sheets, coil and bar stock pieces, extrusions and other similar parts.



FOR TAPERED PARTS: V-type unit simultaneously polishes both sides including tapers of such parts as screwdriver bits and chisels.

Roll Form Counts—For success with abrasive-belt finishing, development engineers at Acme Manufacturing Co., Detroit, stress importance of design of the contact roll. There's a rule of thumb to go by: for more stock removal use a harder durometer roll, straighter serration and larger gap ratio to land.

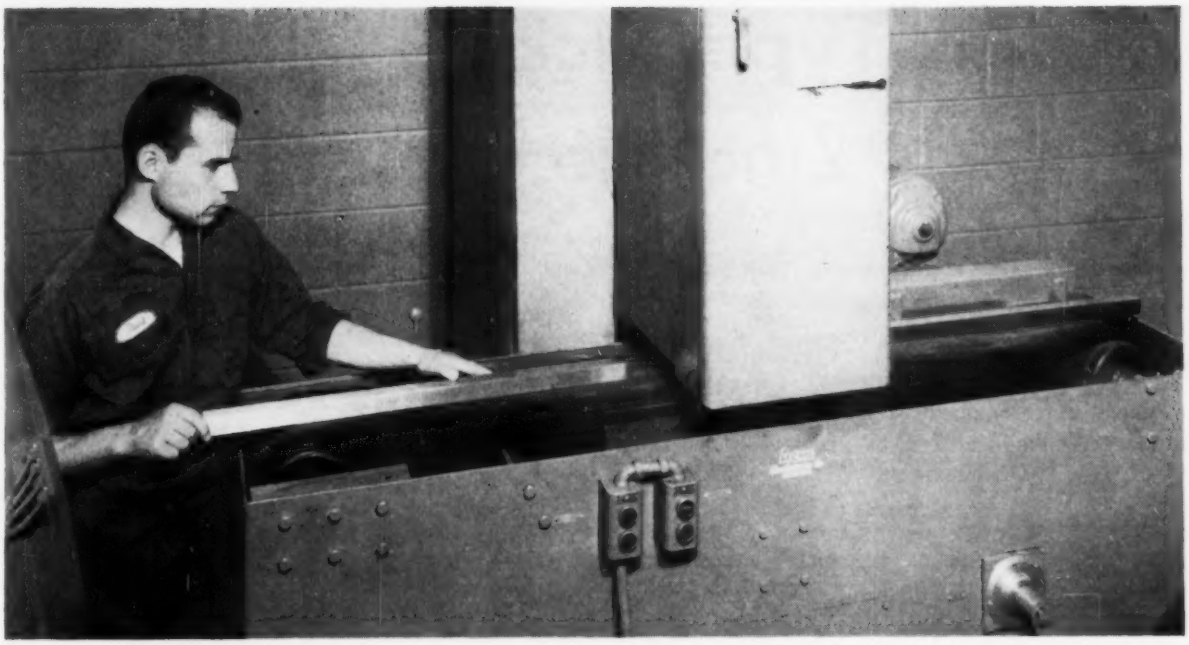
As you move over to accent the polishing function, your roll becomes softer. A rather typical grinding and polishing job starts with a roll serrated at 60°; you may finish with one at 10°.

Another big factor is the pressure or "billy" roll. It's a choice between maintaining part thickness with a pneumatic roll, or sizing the piece with a fixed roll. With the air-type roll you follow the surface hills and valleys and take off about the same amount of stock everywhere. Of course, it's vital for all rolls to be well balanced to avoid damaging vibrations.

Wet or Dry?—There are lots of belt grinding and polishing jobs done dry. But if warpage, finish or cleaning are problems, the right fluid may help. If you're doing a heavy job on hot-rolled steel blanks, you may need the cleaning action of water to keep the belt cutting properly and add to belt life.

On a fine tablespoon blank of German silver or high brass being prefinished, the producer wants to take off no more than 0.0003 to 0.0005 in. For such a job, a finish compound sprayed on the belt gets a fine finish.

Again, on printed circuits only



CONVEYOR FEED: Cold-rolled stock for furniture frame goes through debur and grind on universal joint unit.

about 0.0002-in. metal need be removed. You just want to clean off residue, get into good plating copper and flatten the surface. A fine belt of 240 or 320 grit is usually used wet with water.

Flexible Setups—The big point to note for prefinishing small flat parts is that standard equipment will usually do the job. This is particularly true of batch processing.

The production manager can choose a conveyor-type setup as the most universal in application. With this he can add holding fixtures, simple or complex as size and shape of parts dictate. These could be hold-down rolls, magnetic platens, cleated belts or other special types of conveyors.

If the shop has to grind and polish long bars, coil stock or strips of any kind, it would go into a pinch-roll type of machine. There's even a V-machine design for polishing both sides of small tapered or flat parts such as screwdriver bits, chisels and flatware.

Can Automate — Because most grinding and polishing jobs take two or more setups with different belt grits, multiple head machines really pay off for continuous production. Happily, standard heads and other components can lend the simplified building-block touch to such specials—and hold down capital costs as well.

Let's look at an example of such low-cost automation. A manufacturer of filing cabinets was running a whole batch of cabinet fronts through an abrasive belt layout on a large table, then setting up again with a finer grit. This way the shop could do 800 pieces per hour.

A four-head setup with varying grits and in-line processing now can finish at a rate of 2400 per hour.

Avoids Marring—Other developments include rotary tables with as many as seven heads with a succession of finer grits. A nice feature about this arrangement is that a single operator can handle the loading and unloading. The in-process transfer avoids scratching or marring of parts common with manual handling in a series of finishing steps.

An extreme example of mechanical processing is a new mill setup for conditioning stainless coil stock. This is a process of removing imperfections, imbedded scale, even minor folds and cracks.

Operators perform a spotting operation. When they find part of a coil with a bad spot they run it back and forth until imperfections are gone. The back and forth feed depends on coil tension pulling it through the rolls.

Saves Scrap—This grinding and polishing saves the mill considerable scrap. As scrap, a coil was worth no more than $200; when conditioned, its value is more than $700.

Potential of abrasive belt finishing has been barely touched. Many more savings await metalworking plants, especially in simplified processing of small flat parts. And best of all, smaller shops stand to gain from experience in production engineering of volume jobs.

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Duplex-Type Nickel Plate Protects Zinc Die Castings

Here is a new approach — a plated coating for die castings that is really corrosion resistant.

It's a natural for the automakers, but others will welcome it for the same reasons.

▪ A double layer of nickel of the duplex type gives superior corrosion resistance to zinc die castings for outdoor exposure. It is highly recommended for exterior automotive hardware, according to M. R. Caldwell of National Lead Co.'s Doehler-Jarvis Div., Toledo.

The life of a copper-nickel-chromium plated die casting is only as good as the copper-nickel plate. A study of plated parts taken from cars exposed to industrial and salt spray atmospheres has proven that a very high percentage of corrosive attack results from penetration of the electroplated coating from the outside.

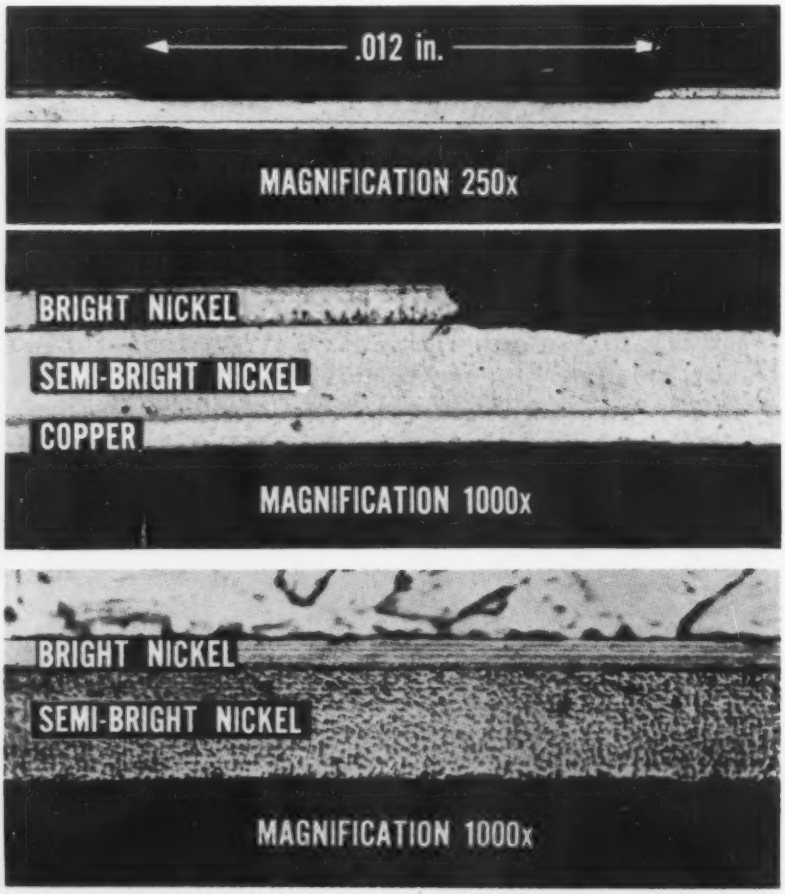
Describes Corrosion—This means that the corrosive material must first travel through the cracks or pores in the chromium plate. Then it penetrates the nickel and copper to reach the zinc base. The primary function of the chromium is to resist tarnishing. Normally, the chromium layer is deposited with cracks and does not contribute to corrosion resistance.

Three methods can be used to improve Cu-Ni-Cr plate. One is to improve the nature of the chromium plate by increasing thickness and eliminating cracks and porosity. A second approach (expensive and not always effective) is to increase the thickness of the nickel plate. Even with heavier deposits of bright nickel, early failures have been found.

Best Method—A third approach is to use a double plate of nickel of the duplex type. Doehler-Jarvis Div. has pioneered in its use for plating zinc-base die castings for parts that require improved corrosion resistance. Its corrosion- resisting properties have been comprehensively tested.

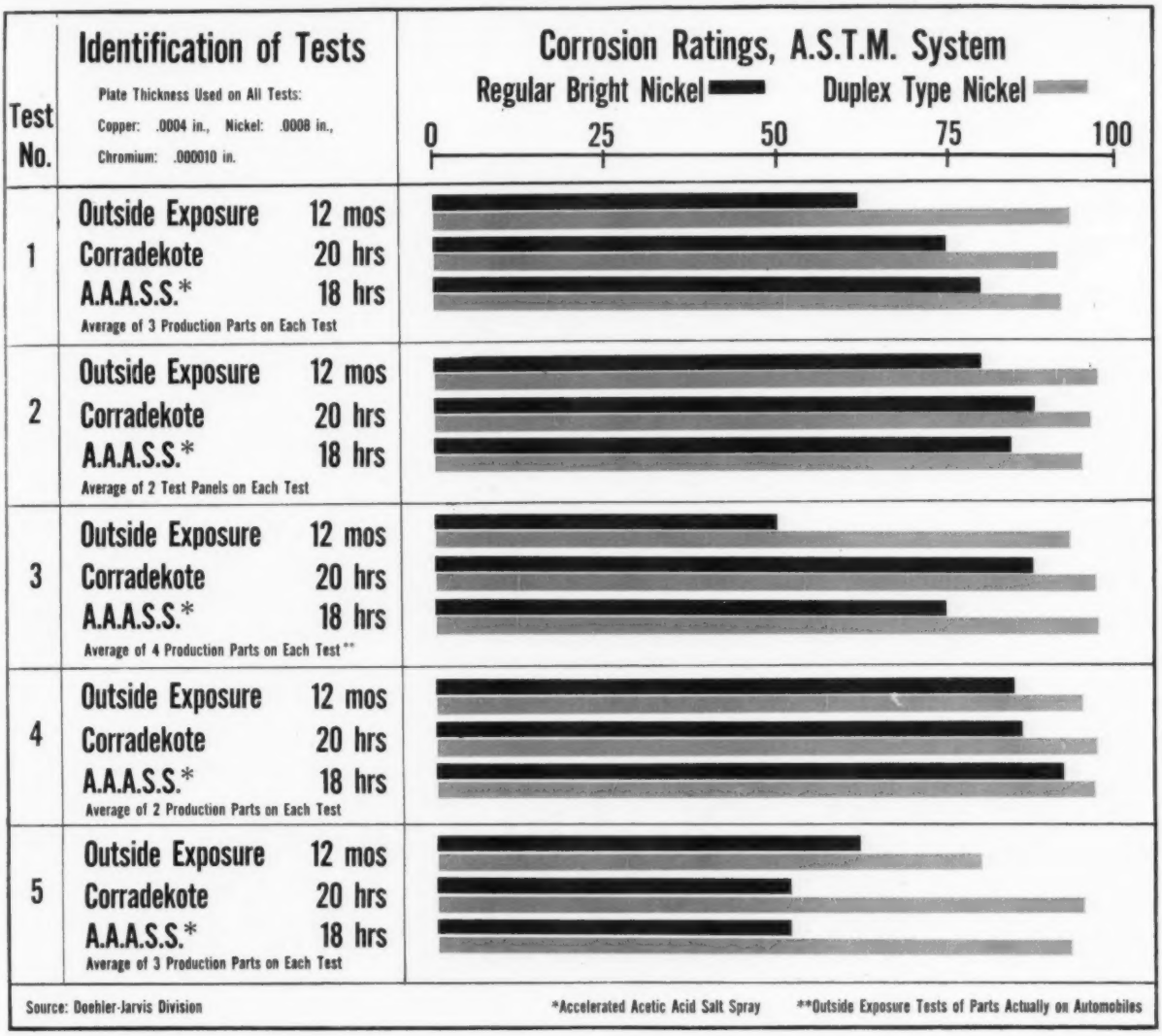
The plating process is adjusted to specific operating conditions in order to maintain required brightness and adhesion. The first coat is semi-bright and the top coat full bright. The combination results in a decorative finish. The semi-bright coating (60 to 75 pct of total thickness) is made from a sulphur-free bath. It does not contain sulphur-bearing organic compounds.

With this type of semi-bright nickel, corrosive materials do not penetrate or corrode through as fast. Overall life is increased from 25 to 33 pct.



BIG DIFFERENCE: In the top two views, a section through a pit shows corrosion through the chromium and bright nickel. Attack spreads laterally. The banded structure of bright nickel (bottom) stands out in contrast with the columnar structure of the semi-bright nickel plate.

Corrosive Test Results Are Impressive



Protects Base — A photomicrograph proves the point. The top layer is the chromium and the bright nickel. Corrosive attack is slowed so much by the semi-bright layer that the corrosion process is forced to spread laterally instead of vertically through the deposit to the base metal. Without sulphur brighteners, semi-bright nickel has an entirely different grain structure.

Another photomicrograph shows the banded or laminated structure of the bright nickel section. Semi-bright nickel has a columnar structure similar to that of Watts nickel. Structurally, it is more resistant to corrosion.

A bar chart compares the results of five different corrosion tests completed in the last few years. In every case, duplex-type nickel (double plated) is superior to regular bright nickel.

Test Results—Additional corrosion tests were run by an automotive company. Again, the duplex-type plate was compared to two standard bright nickel plates. Both coatings were exposed in five different types of corrosion tests: 1) 8 days acetic acid-salt spray, 2) 8 days neutral salt spray, 3) 16 hrs copper-accelerated acetic acid-salt spray, 4) 48 hours in this same environment, and 5) 34 days on a Detroit laboratory roof.

In all cases except the neutral salt spray test, duplex-type nickel showed no signs of corrosion spots. Regular bright nickel plate showed corrosion spots through to the base metal. In neutral salt spray, all coatings tested showed signs of serious corrosion.

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STYLUS TELLS: Quality control analyst checks gear-measurement data from a readout unit which is part of automatic gage installation. Statistical setup charts only certain gears, discharges them separately.

Automatic Quality Control Cures Manual-Gaging Delays

By **A. J. LeFevre**—Manager Quality Control, Automatic Transmission Plant, Ford Motor Co., Livonia, Mich.

Volume production isn't the only reason behind the swing to automatic gaging. Delays and errors in manual inspection can also justify its use.

Automatic setups for gaging can keep pace with demands for 100 pct inspection.

▪ Automatic quality control methods are virtually a must in many areas of metalworking today. In the automotive industry, for example, manual inspection can't keep pace with automatic mass production of close-tolerance parts.

Even with our best manually operated instruments and gages, human errors do occur on routine, repetitive inspections. We find, as other industries do, that so-called "normal" 100 pct inspection is only a little better than 85 pct effective.

Need Better Methods—And yet, repetitive, accurate measurement is more necessary than ever to insure that parts meet specifications. For one thing, the machines that make these parts get faster and more automatic all the time. Also, because cutting tools and machine components do wear, parts don't always come out to exactly the same size.

This is why automatic inspection methods that can keep pace and remain accurate must be viewed with respect. With proper maintenance of the inspection devices, such techniques can be close to 100 pct effective.

Aside from accuracy, automatic inspection offers other advantages. For one thing, it saves on floor

space. If we had to manually inspect thousands of automatic transmission parts we would have trouble finding sufficient plant area to do it, to say nothing of skilled manpower and other facilities.

Brings Other Benefits—To list still more advantages, automatic quality control can also lead to: fewer rejects, less waste in machine and manhours, longer tool life, increased production, thriftier use of material, lower inspection costs, beneficial engineering changes in part design, more accurate assembly of finished parts.

However, any consideration of automatic quality control must be based on a close look at all the problems and cost factors that might either encourage or discourage its use.

For a typical application of automatic quality control, let's see how it works out for the pinion gear in our automatic transmission gear train. Many of the tolerances on this part (and others) are in the 0.0005 in. range.

Classifies Parts—Our automatic gages are set up to identify various dimensions at any stage of production, and to segregate parts into various tolerance classifications. In qualifying blanks after initial facing operations, for example, an air gage checks hole size, overall length, concentricity, and squareness of the face.

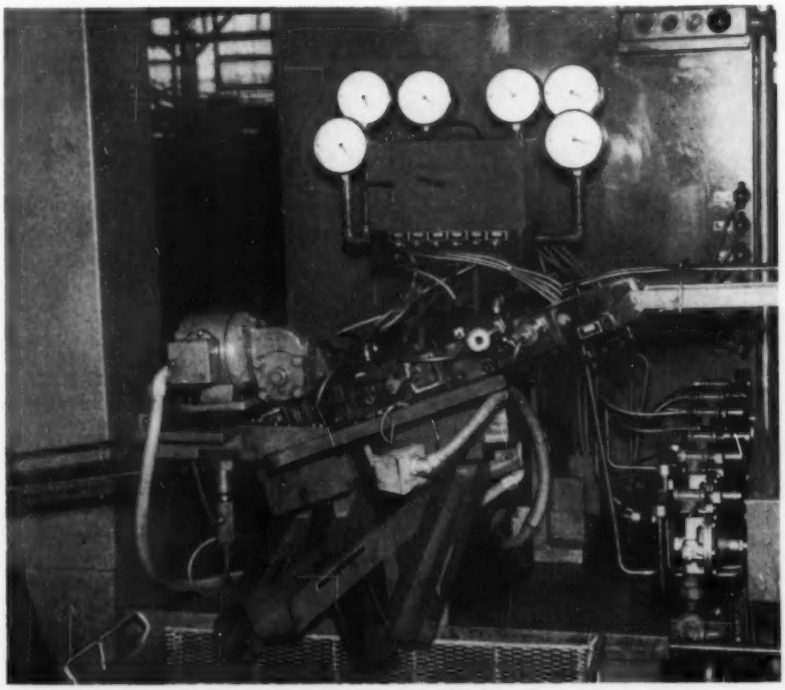
If the part is beyond limits in any of these respects, the gage kicks it out to the undersize or oversize chute provided for each dimension. Oversize pieces are salvaged and reworked.

Later on, another automatic unit checks the gears after they've been hobbed and shaved. It gages tooth size, helix angle, and lead, and it rejects out-of-tolerance parts. It will also chart deviations from specified dimensions.

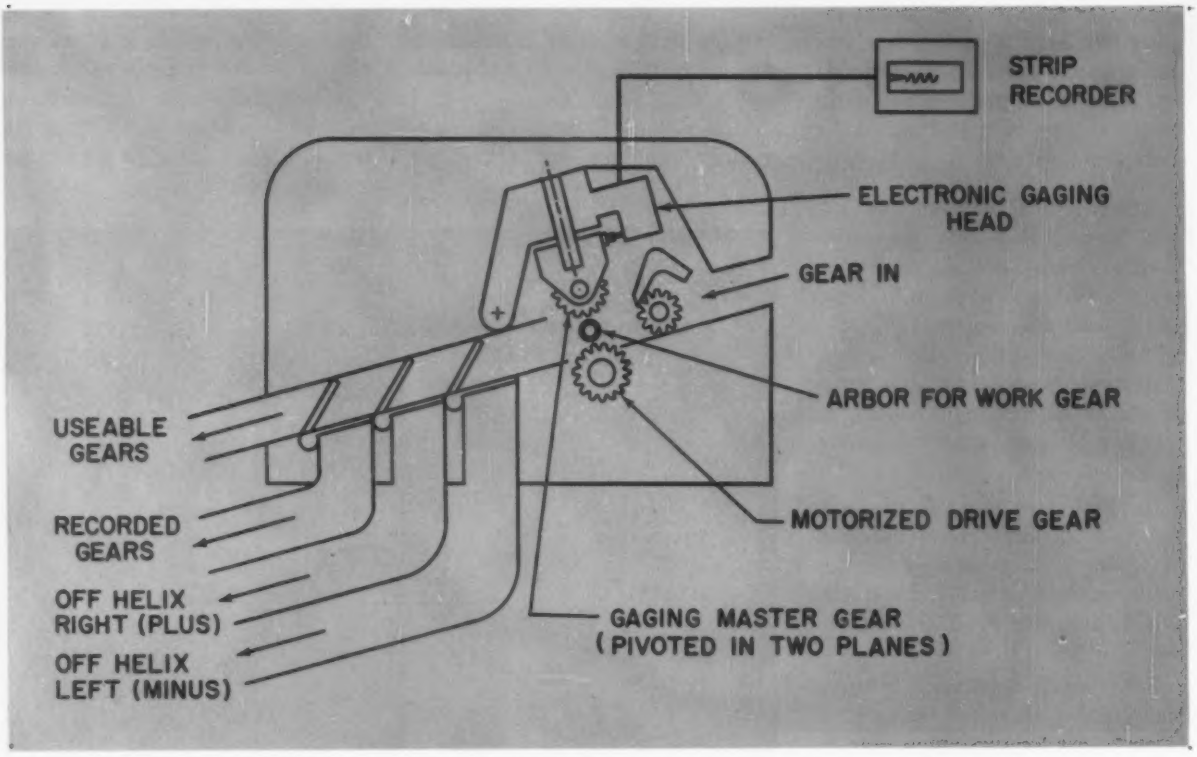
Typical Device—Although this is one of our most sophisticated operations, the unit and the procedure are typical of modern automatic inspection methods. Basically the unit has three separate components: a gear-gaging head, a control panel, and a charting device.

Hobbed and shaved gears automatically advance one at a time from a storage chute to the gaging station. Here an arbor enters the hole of the test gear. Both the tooth size and helix-angle accuracy of the workpiece are checked as it makes a single revolution in tight

POSITIVE CHECK: Automatic gage, developed by Ford quality control engineers and National Broach & Machine Co., inspects 100 pct of pinion gears produced for automatic transmissions. Author A. J. LeFevre examines a gear which has just been gaged on all critical dimensions.



GAGE AND SORT: Sheffield gage checks ID, OD, concentricity and length on semifinished blanks. It sorts rejects into scrap or rework chutes.



INSIDE VIEW: Schematic of National Broach gage which checks size and accuracy of Ford pinion gears.

mesh with a master gear.

Electronic sensing heads measure any angular or radial displacement of the master gear. Out-of-tolerance workpieces drop out through an exit chute; gears that pass this test are diverted to a separate collector unit.

Can Print Record—Signals from the electronic sensing head are picked up by a recorder. The instrument is equipped with a stylus for inking measurements on a paper chart. Charted records can be made continuously at the push of a button, or intermittently at intervals which can be preset on the gaging device.

An inspection program that develops this kind of information replaces guesswork with facts. And facts save money.

Best Costs Less—For example, it's our belief that parts produced at the most reasonable cost are those which match the specifications. Any others are expensive, since they may cause costly assembly teardowns or other problems which greatly increase the final cost of the product.

Automatic quality control saves money by giving us selected, matched-size parts. Such parts not only make the transmission-assembly job easier and less critical, they give us assurance that the assemblies are top-quality products.

We're at the stage now on the pinion line where we automatically check virtually every specification on the part print. But we've run into a new type of problem—maintenance. Because much of the inspection equipment involves electronic devices, maintenance is most important.

Need Training Program—We find that carefully-developed training programs are a must. There doesn't seem to be enough available personnel in the electronics field, especially for maintenance. Yet constant gage surveillance and servicing is needed to keep the line operating.

This is now a big part of our quality control effort. For contrary to a rather widely held opinion, you just can't push a button to start an automatic production line and then walk away expecting it to turn out perfect parts indefinitely.

With this kind of equipment you need someone there to avert trouble or to stop production quickly if something goes wrong. You might call this preventive maintenance. But it's vitally necessary if you want to get maximum production, maximum quality, and avoid machine smashups.

Looking to the future, automatic gaging offers another interesting possibility: the readout of information from various processing lines. This could yield statistical data on production even as the parts were being produced. Such information could be used to good advantage—for example, in analyzing tool life.

We can look ahead to still more interesting possibilities when automatic statistical control becomes fully integrated with production. This might well lead to tape control inspection operations.

Steel-Encased Brick Triggers Increased Steel Production

Basic brick encased in steel sheet is now being used in openhearth roofs, bottoms, and walls.

Helping to boost steel output, these brick also have many other important applications.

▪ About 90 pct of the nation's steel is produced in openhearth furnaces. That's why the development of metal encased and reinforced all-basic refractories is so important. Because they can be used in openhearth roofs, they help make the oxygen steelmaking process entirely practical.

Above all, they permit the higher operating temperatures produced by the use of oxygen. These temperatures, in turn, are responsible for cutting costs and boosting openhearth output by as much as 10 to 15 pct.

For Openhearth — Basic brick consists of magnesite, chrome, forsterite and their mixtures. It has been used in the furnace hearth since the beginning of openhearth steelmaking because of its superior serviceability.

For years, it has been known that basic brick in the roofs would permit even higher furnace temperatures—thus speeding the refining process. But mechanical problems and the limitations of available basic refractories made basic roof construction economically impractical. Not until the introduction of oxygen in steelmaking did the all-basic furnace progress beyond the developmental stage.

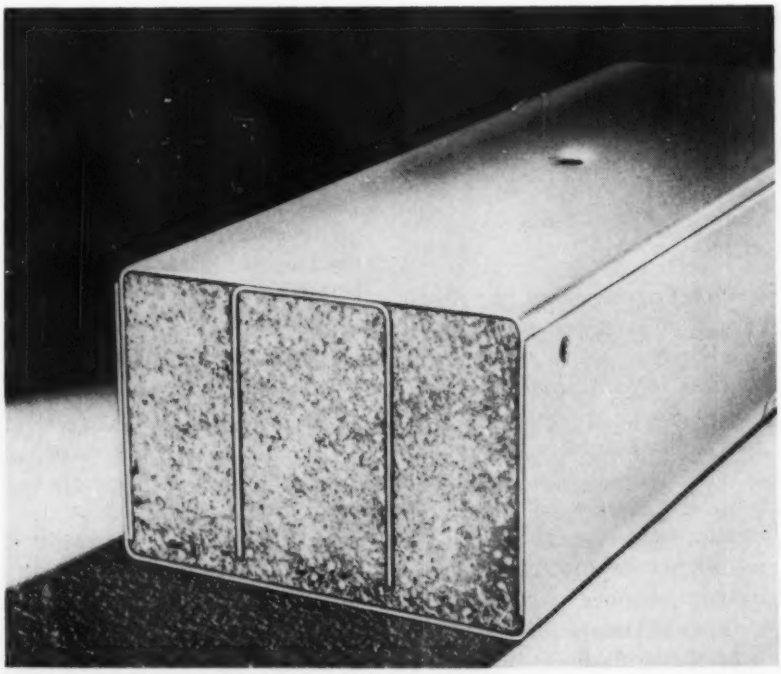
Early Start—A major contribution to the use of basic brick in both furnace walls and roof was the encasing of the brick with steel sheet. This development evolved on a step-by-step basis. Harbison-Walker Refractories Co. introduced its first metal-cased brick over 40 years ago. Since then, the product has undergone many modifications for specific applications. It has been widely used in electric steel furnaces, copper reverberatory and refining furnaces, rotary kilns, and openhearth applications.

One of the company's latest developments is a chemically bonded, magnesite-chrome brick. Its unusual features include special grain sizing, high-purity magnesia content, and effective metal reinforcement. Not only is the brick encased with a welded steel sheath but additional steel reinforcement is embedded during pressing. These bricks have scored excellent service records in openhearth roofs.

Two Roofs—Development work with basic brick in the openhearth roof has been concerned with both suspended and sprung arch construction. In the suspended roof, the brick are hung or suspended singly or in groups. In true sprung construction, the brick form a natural arch which is supported by skewback brick on top of the front and back walls.

The rather recent success of the sprung arch roof stems from engineering and design changes that originated within the steel companies. A special basic refractory, like the Harbison-Walker product, was required before the roof itself became feasible or serviceable.

Cost vs Savings—Initial cost of the basic roof is higher than that for silica brick. The economies of basic brick are found in longer roof life and as much as 10 to 15 pct in increased production.



NEW BRICK: Developed especially for openhearth roofs, this basic brick is encased with welded steel sheet, is also steel reinforced.

Aluminum Alloy Rivets Excel For Magnesium Sheet

By J. L. Nichols—Metallurgical Laboratory, The Dow Chemical Co., Midland, Mich.

What is a satisfactory fastener for magnesium sheet?

The answer involves not only the strength of a material but also its galvanic compatibility.

■ An improved fastener material is sorely needed for magnesium sheet—especially in critical missile and supersonic aircraft applications. For a number of reasons, the requirements are difficult to meet. But fortunately, The Dow Chemical Co. has come up with what it has found to be a completely satisfactory answer: high-purity 5056 aluminum alloy. The material contains about 95 pct aluminum, about 5 pct magnesium.

Galvanic corrosion occurs when dissimilar metals are in contact in an electrolyte. This means that a suitable fastener must be galvanically compatible in addition to meeting mechanical property requirements. Several aluminum alloys provided adequate strength and compatibility when coupled to conventional aluminum-zinc containing magnesium alloys.

Main Problem—With the advent of the high-temperature, magnesium-thorium alloys, these same fasteners proved inadequate. The reason: loss of strength, or loss of galvanic compatibility, or both at elevated temperatures. And so a systematic search for compatible, high-temperature fasteners for use in magnesium structural applications was begun.

Dow's metallurgical research now indicates 5056 alloy (and possibly 5052 and 6061 alloys of similar purity) will fill the need. Test results show that these alloys are compatible with the new magnesium-thorium alloys as well as with the conventional AZ31B in the room temperature to 800°F range.

Adequate shear strength was retained by 5056 alloy over most of this temperature range. Overall indications are that a high-purity 5056 composition will make a good general-purpose fastener for magnesium.

Try Aluminum—Magnesium, itself, might be considered for many fastener applications. But in the case of solid rivets, resistance to deformation of most magnesium alloys at normal rivet-driving temperatures makes it impractical. That is why the more readily deformed aluminum alloys are preferred.

Dow's recent studies have shown that high-purity aluminum is extremely compatible with magnesium. Very little galvanic corrosion occurs on either the magnesium or aluminum member of the couple.

Further research uncovered the effects of impurities on the cathodic performance of aluminum and the mechanisms responsible for this performance. Four factors influence the compatibility of the aluminum-magnesium relationship.

Four Factors—First is the heavy metal content of the aluminum alloy. Iron, copper, and nickel are extremely harmful. They must be controlled at low levels for complete compatibility. Compatibility actually decreases as heavy metal content increases.

The magnesium content of the aluminum alloy is a second factor. Increasing magnesium content causes partial or complete suppression of the effects of iron, copper, and nickel.

The environment of the couple is also important. Sea water, for example, has a far less corrosive effect than a sodium chloride solution.

A fourth factor is the solution potential of the magnesium alloy. Thorium-containing alloys (especially HK31A) have a stronger electro-negative potential than do aluminum-zinc containing alloys such as AZ31B. That is why some aluminum alloys that are extremely compatible with AZ31B are somewhat less compatible with HK31A.

Key Advantages—The fact that high-purity 5056 contains a minimum of heavy metals and about 5 pct magnesium points strongly to the fact that it should offer maximum compatibility with magnesium. Relatively high magnesium content should contribute heavily to the strength of the alloy. On this premise, high-purity 5056 was investigated from a galvanic corrosion and shear strength standpoint.

This material was aged for times of 45 minutes, 10 hours, and 100 hours at 800°, 700°, 600°, 500°, 400°, 300°, and 200°F. Results showed that when 5056 alloy is made from high-purity (99.99 pct) aluminum, no harmful effects of aging on galvanic compatibility are observed for the times and temperatures studied.

These conclusions were based on the exposure of test panels for 100 hours in 20 pct NaCl spray. The panels were made from AZ31B, HK31A-H24, and HM21A-T8 magnesium, anodized by the Dow 17 treatment and sealed with a clear vinyl coating. Rivets were inserted

in these panels and electrical contact established.

Work Together—That high-purity 5056 alloy and HK31A-H24 are compatible is seen in condition of a test panel after 100 hours exposure to 20 pct NaCl spray. The high-purity alloy has caused practically no galvanic corrosion to the magnesium panel.

Double shear pin tests were run on a Riehle testing machine, equipped for testing mechanical properties at elevated temperatures. A check of furnace characteristics showed that it took 45 minutes at 700°F to bring the rivet assembly up to this temperature. Hence this time was chosen as the shortest time for the study.

Rivets made from 5052, 6061, and 5056 alloys were aged for 10 and 100 hours at the desired temperature, allowed to cool to room temperature, and then tested at the aging temperature. Shear strengths were obtained on single rivet specimens (undriven) at 700°, 600°, 500°, 400°, and 300°F and room temperature. Commercial-purity rivets were used for these tests, since tests with 5052 and 5056 alloys showed the shear strength of the material to be unaffected by the impurity content.

Aging Effects — The results of these tests are shown in Fig. 1. They indicate that the only alloy of the three which shows a dependence on time of aging is the 6061 type—at least for times up to 100 hours. As suggested by tensile strength values, there is a shear strength inversion between 5052 and 6061. The temperature at which this cross-over occurs depends on aging time.

Most important are the shear strengths shown by the 5056-H32 aluminum alloy. These are exceptionally high when compared to the calculated values for this alloy. To verify this curve, duplicate samples were selected from five different lots of 5056-H32 rivets which were tested at 600°F after 45 minutes heating time.

Peg Use — All of the shear strength values for the 5056 rivets tested at this temperature fell between 10,800 and 11,800 psi. Spectrographic analysis of the original 5056 rivet sample showed a composition within the specifications for commercial-purity 5056 aluminum.

The bearing properties of HM21A-T8, a high-temperature magnesium alloy, are compared with the shear strength of 5056-H32 aluminum in Fig. 2. Under the conditions of this test, the ratio of ultimate bearing strength of the magnesium alloy to the shear strength of the aluminum alloy remains relatively constant up to 550° to 600°F.

Beyond 600°F and up to 700°F, the shear strength of 5056 falls off more rapidly than does the bearing strength of the magnesium alloy and has limited serviceability.

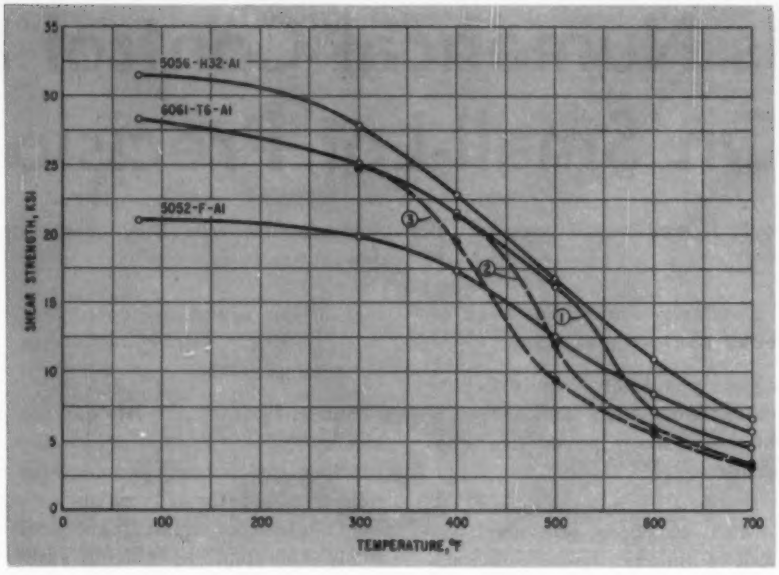


FIG. 1: Shear strength is an important property in many applications. Here is how time at temperature affects three aluminum alloys.

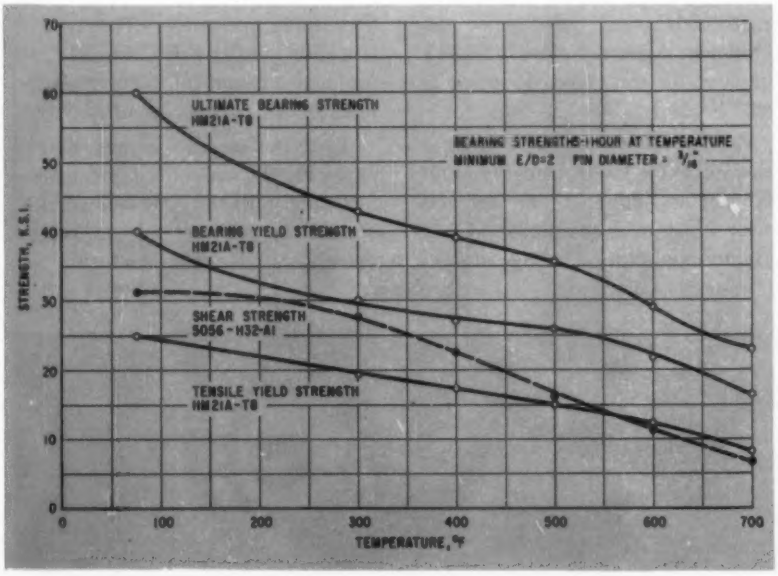


FIG. 2: Temperature is a factor likely to affect some mechanical properties. This data applies to both an aluminum and a magnesium alloy.

Is Numerical Control Practical On Small-Lot Precision Work?

By P. J. Wolff—Staff Ass't. to Chief Production Engineer, Lear, Incorporated, Grand Rapids

Emphasis to date has been on heavy contour machining.

The problems are different where short runs of extremely accurate small parts are concerned.

▪ Much has been said about the merit of numerically controlled machine tools (NCMT) for high-production, normal-tolerance heavy machining. But what about small-lot, high-precision machining combined with many short-order development contracts; will NCMT cut costs in this kind of work as well?

Most of the manufacture at Lear falls into the latter category. Our first step in finding the answer was to see which of the available NCMT systems might provide biggest savings in our operations: continuous path positioning or point-to-point positioning?

Small Parts, Many Holes—We settled on point-to-point positioning (drilling, jig boring, punching or hole grinding); the bulk of our output consists of small parts with many hole patterns ranging from 0.0370 to 1.000 in. diam.

Continuous path positioning (straddle milling, contour milling and lathe work) is mainly for heavy contouring operations. This type of machining is rare in our field, so the high equipment costs can't be justified by savings as of yet.

Thus, our search was narrowed to exploring the economics and manufacturing reliability of numerically controlled drilling and jig boring operations. By manufacturing reliability we mean the ability to repeat high accuracy in production.

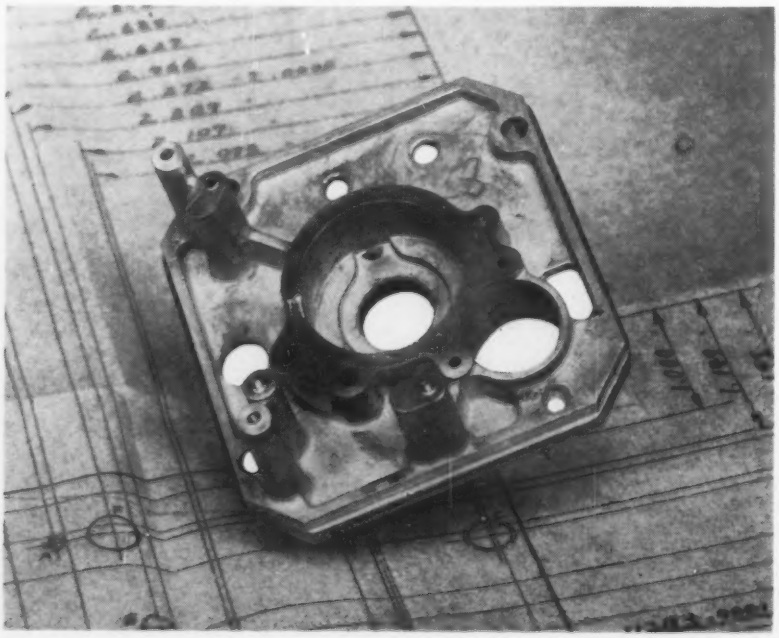
Total All Variants—Too often, positioning accuracy of a point-to-point x-y positioning table is wrongly interpreted as parts accuracy from hole center to hole center. Finding parts accuracy requires taking into account all the tolerances errors of present systems—positioning and repeatability accuracy of the table, machine spindle accuracy, drill straightness and how closely it self-centers.

Adding all these, we find total expectable center-to-center accuracy of today's systems ranging from ± 0.0039 in. for drilling holes to ± 0.00045 in. for boring.

It's possible to make a wide-tolerance positioning system produce tight-tolerance parts accuracy by means of certain tricks in programming. But from a production engineering standpoint, we can't call the NCMT system reliable if we have to program dimensions other than nominal drawing dimensions.

Price Is High—The cost of a system is in direct proportion to the degree of accuracy it effects. It can run from about $30,000 for an accuracy between hole centers of ± 0.004 in. to something like $75,000 for ± 0.0005 in.

A coordinate drawing with position tabulation is needed for a workable system in manufacturing operations. Greatest economy comes from using the same drill-bit for holes of different depths. For this reason the machine control—in particular, depth and feed control—as well as the positioning control should be tape programmed. This will ease the problem of crowding the program for an intricate part onto a 6-spindle turret in one setup.



STRESS ACCURACY: When comparing tooling cost and direct labor savings of precision part, estimates come out in favor of numerical controls.

Tooling cost and direct labor savings were estimated for a typical part (shown in the photo). In the accompanying bar chart, tooling cost, setup time and floor-to-floor time for NCMT are compared with like data for conventional drilling and jig boring. In addition, the dollar savings per piece are established in relation to small-order small-lot size and large-order medium-lot size.

Justifies Outlay—Quite clearly, NCMT can make for big savings. But watch out, machine time per piece will increase in larger lot production if compared to multiple hole drilling with commander head. However this is strictly unattended machine time.

The final table gives an idea of equipment cost recovery. At the present time, NCMT calls for a rather high capital investment. To talk in normal accounting recovery terms like three years or one year can be misleading; only the machine tool and table might depreciate, while the electronic control can be reused. Remember that only about 30 pct of equipment cost is in the actual machine tool; all the rest is in the control system.

Fits In Well—To date, the machine tool industry has directed most of its effort toward the economic benefits of NCMT in heavy machining operations. Savings can also be realized in the precision instrument industry, or any other which deals with small parts and extremely high accuracy.

Better justification and lower equipment costs would result from light-duty machine tools equipped with numerical controls. Most parts for aircraft instruments are made of aluminum and magnesium alloys. This means low cutting pressures and small positioning tables as well as low mass and inertia on positioning slide systems. In all, the machine designer's task should be somewhat simpler on light-duty numerical controlled machine tools.

NCMT Pays off on Instrument Work

Numerically Controlled Drillpress (low accuracy, medium duty):

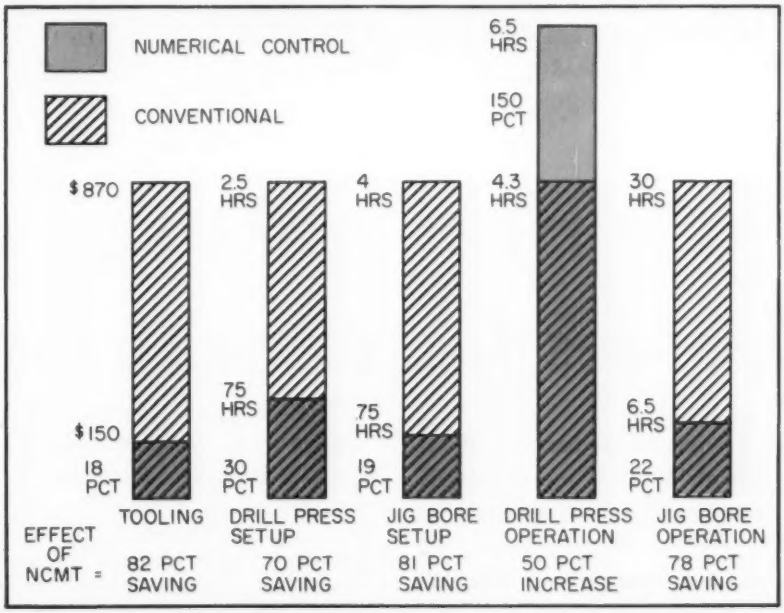
Order size	100	1000	10,000
Savings per order	$760	$719	$130
Number of different orders needed to amortize equipment	40	42	230

Numerically Controlled Jig Bore (high accuracy, heavy duty):

Order size	100	1000	10,000
Savings per order	$839	$1545	$7920
Number of different orders needed to amortize equipment	90	49	10

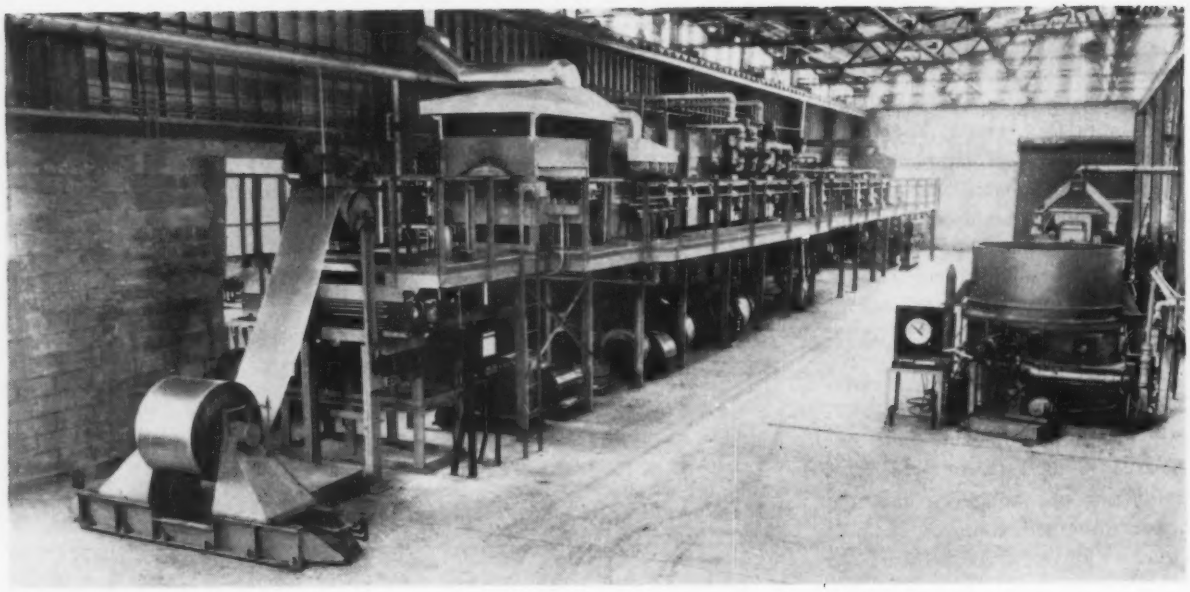
Conclusion: Best economic justification of numerical control lies in orders of 1000 pieces and lots of 80. This is because conventional tooling cost per piece decreases at high quantity levels.

How Costs Compare on Precision Part



Cost Goes Down as Quantities Increase

Work Performed						
Order Size	100		1000		10,000	
Lot Size	20		80		500	
Tooling, Cost per Piece in Dollars						
Drillpress: (low accuracy, ± 0.004 in.)	**Conv.**	**NCMT**	**Conv.**	**NCMT**	**Conv.**	**NCMT**
Tooling	8.70	1.50	0.87	0.15	0.087	0.015
Setup	0.38	0.11	0.094	0.025	0.015	0.004
Operation	0.13	0.20	0.13	0.20	0.13	0.20
Total	9.21	1.81	1.094	0.375	0.232	0.219
Jig Bore: (high accuracy, ± 0.0005 in.)						
Tooling	8.70	1.50	0.87	0.15	0.087	0.015
Setup	0.60	0.11	0.15	0.025	0.024	0.004
Operation	0.90	0.20	0.90	0.20	0.90	0.20
Total	10.20	1.81	1.92	0.375	1.011	0.219



CONTINUOUS: This new pilot strip furnace comprises five heating zones, is equipped for atmosphere control.

New Heat Treat Laboratory Serves Customer's Needs

A leading manufacturer of industrial furnace equipment is now providing a comprehensive heat treat laboratory service as well as promoting its own process research.

▪ If you're in the market for new heat treating equipment or have a heat treating problem that might ultimately require the purchase of new equipment, The Electric Furnace Co., Salem, O., now offers a new and complete laboratory service to fill the bill.

The company recently opened one of the largest and most completely equipped laboratories for the heat treatment of ferrous and nonferrous metals. Differing from most laboratories, the new setup is provided with all production-type equipment intended to simulate actual commercial operations.

Broad Range—The nature of research in furnace heat treating is extremely varied. For this reason, the layout of the new laboratory emphasizes flexibility. It can handle virtually any research problem in furnace treating that might arise.

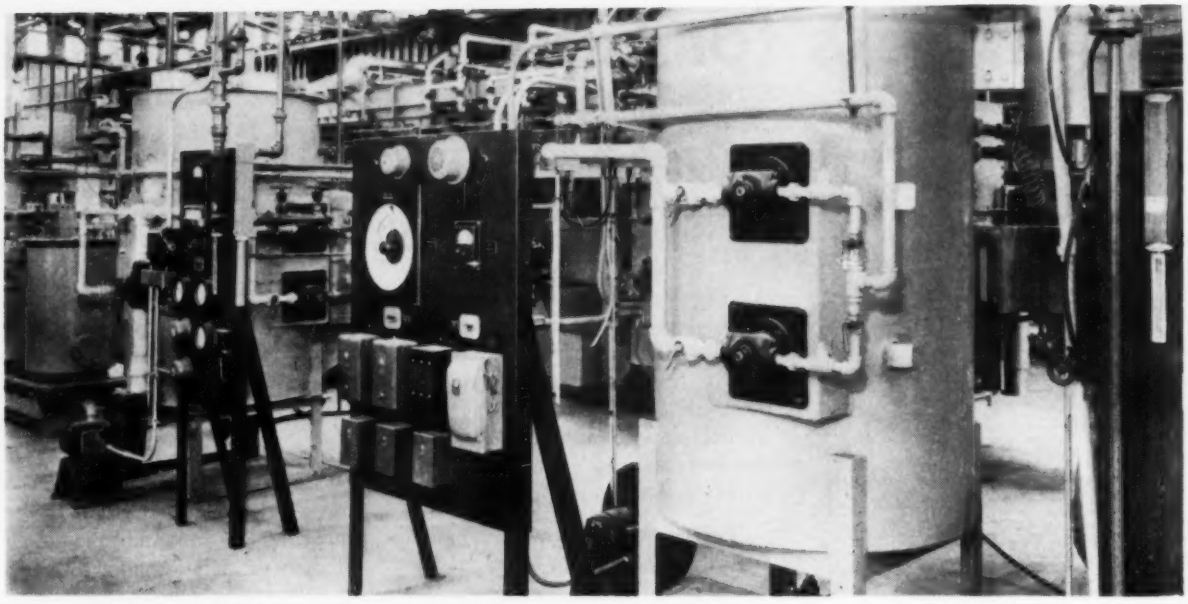
The new research building consists of two bays and covers over 14,000 sq ft. The eastern bay houses both a continuous strip furnace and a bell-type furnace. It is provided with an overhead crane capable of handling coils and other materials weighing up to 10,000 lb.

The continuous strip furnace has five compartments or zones. It will handle strip up to 26 in. wide in coils having 16-in., 20-in., or 24-in. ID.

Guards Atmosphere — The first unit or zone consists of an independent, impingement-type flame cleaning and preheating unit. Here the strip is exposed to the products of combustion from the burners located in the hearth and arch. The burners can be adjusted to fit the width of strip being heated and can preheat the strip to about 800°F. Preheating burns off the film of roll oil on the surface of the strip, preventing contamination of the furnace atmosphere.

Flame heating by direct firing has the further advantage of providing a uniform surface on the strip as it enters the furnace. It avoids variations in surface characteristics such as those due to differences in surface finish.

After the flame heater, the strip crosses an air gap and enters the heating section of the furnace through close-fitting seals. From this point on, the strip is in a controlled atmosphere until after it has been cooled below oxidizing temperature.



FOR PROTECTION: Special protective atmospheres are generated and controlled with this equipment.

Zone Heating — The first (or heating) zone of the atmosphere furnace is equipped with gas-fired, radiant tubes that heat the strip rapidly to temperatures up to 1850°F. The second, or soaking zone, is separated from the heating zone by a 9-in. refractory baffle. Heated electrically, it operates at temperatures up to 2100°F.

The third and fourth zones of the furnace are for soaking and/or controlled cooling. These zones are fitted with electrical heating elements for heating and air tubes for cooling. One or both of these zones can be used for soaking temperatures up to 2100°F. Or they can be used for controlled cooling of strip from annealing and normalizing temperatures.

From the controlled cooling zones, the strip passes to an insulated slow-cooling section and then to fast-cooling sections that cool the strip to below its oxidizing temperature prior to its discharge from the furnace. The strip then passes out of the furnace through sealing rolls, leveler rolls, and various steering rolls to the coiling reel.

Maintains Tension — Speed of travel of the strip through the furnace is preset by the tension bridle. This bridle also maintains constant tension on the strip for recoiling. During passage through the furnace and cooling zones, the strip is supported on polished, heat-resisting alloy rolls. Surface speed of the rolls is synchronized with the bridle.

Although this combination of zoning is not likely to be duplicated in a production furnace, the arrangement is well suited for an experimental line. Here, maximum flexibility is needed to properly explore results obtained with various heat treating cycles. The furnace can be used with almost any of the special atmospheres used in commercial production.

Many Applications — This furnace has already been used to explore the effects produced by many different heat treating cycles on tin plate, deep-drawing steel, silicon steel, and nonferrous strip. Results obtained on each of these materials with various protective atmospheres and dew points have also been explored.

Among other equipment available in the new laboratory is a direct gas-fired, forced circulation, bell-type furnace. This unit operates at temperatures up to 1800°F. A retort is available for use with special atmospheres. An important project connected with this furnace is the batch heat treating of wire, rod, and strip in coils up to 28-in. OD.

A radiant-tube tray pusher furnace is another versatile unit of equipment. It is used for dry cyaniding, carburizing, and hardening. It is also capable of controlled carbon restoration on the surfaces of decarburized steel parts.

For Tempering—An electrically heated, forced circulation batch furnace is ideal for heat treating at temperatures below 1200°F. Tempering and stress relieving are its most common applications, though it is also available for the experimental heat treatment of aluminum alloys.

All of this equipment will be used by Electric Furnace to develop improved techniques for heat treating familiar materials and the newer metals associated with the space age. They will also be available to metal producers and processors for development and test work.

Stainless for Condenser Tubing

Even when heat transfer properties are considered, stainless proves profitable.

▪ The power industry is taking a long look at stainless condenser tubing these days—and it all stems from the need for greater operating efficiency.

This need has already spurred the application of stainless for turbines, pumps, screens, pipelines, and other components. But for main surface condensers, stainless tubing has taken a back seat in favor of copper-base tubing.

Why Admiralty — Main surface condensers in power plants have nearly always contained copper-base condenser tubes. The thinking has been that these tubes provide the highest rate of heat transfer available and thus are most efficient at the job of condensing spent steam.

The superiority of copper-base tubing for most heat transfer applications is well established, particularly if corrosion, erosion, and strength are not important factors.

The point is that in the power industry today, corrosion and erosion resistance and strength have become important factors in condenser design. The erosion potential of high cooling water velocities makes silty water even more highly damaging.

Tougher Conditions — The increasing concentration of various industrial wastes in river water has multiplied the possibilities of corrosion from a host of corrodents. Copper-base tubing faces these drawbacks for today's power plants and those of tomorrow.

Recently, the Alloy Tube Div., of The Carpenter Steel Co., concluded a successful series of in-service tests on the heat transfer characteristics of stainless steel and admiralty metal tubes. The tests were conducted on a 40,000 sq ft, single pass condenser having cast iron water boxes and Muntz metal tube sheets. One half of the unit contained admiralty metal tubes and the other half Type 316 and 329 stainless tubes supplied by Carpenter.

Installed at the Edgemoor Generating Station of the Delaware Power & Light Co., Wilmington, Del., the condenser had failed in earlier service due to extensive erosion-corrosion caused by an unfavorable water condition.

Try Tests—The object of the test was to compare the heat-transfer efficiency of a condenser equipped with 20 gage stainless steel tubes with one having 18 gage admiralty metal tubes. Use of the lighter wall stainless tubing was justified by its relatively greater strength and resistance to corrosion.

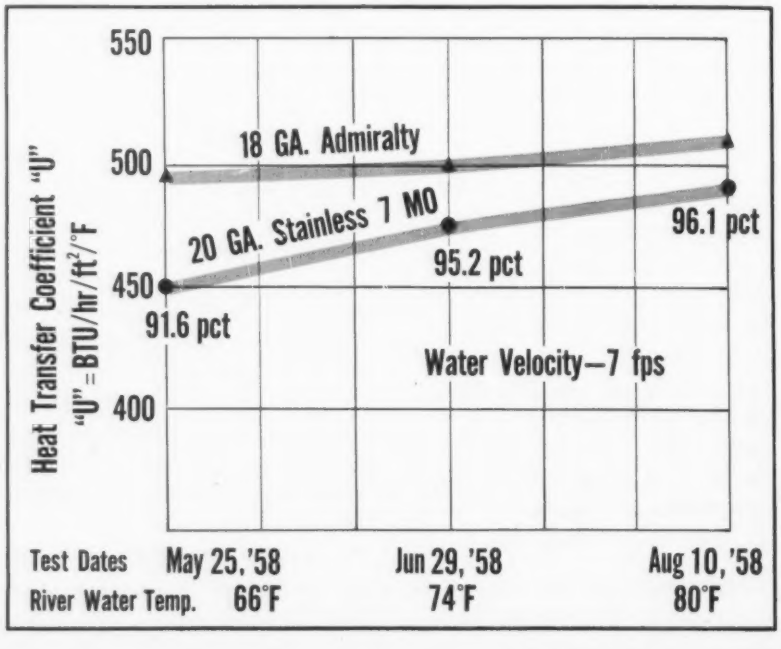
Over a three-month period (May to August, 1958), three test series were carried out at the Edgemoor station. Each series consisted of five separate test runs made on both the stainless and admiralty sides of the condenser under identical conditions.

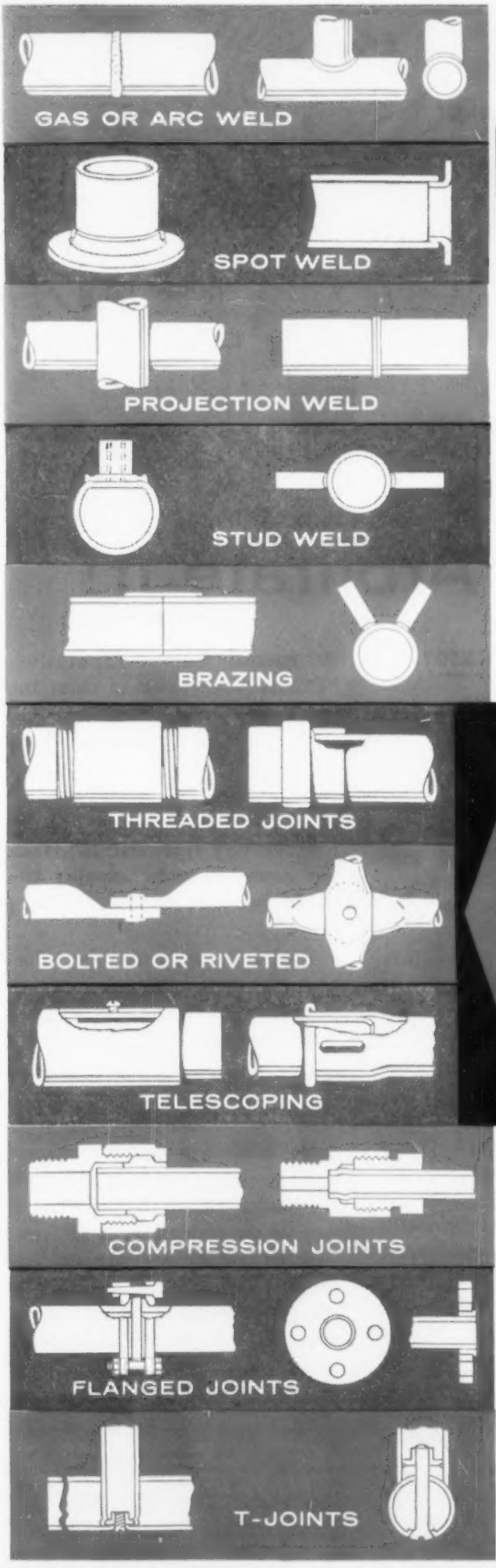
Results of the tests indicated that stainless tubing under service conditions did have a satifactory rate of heat transfer. Comparative heat transfer rates for light wall stainless ranged from 91.6 pct of admiralty in the May series to 96.1 pct in the August series.

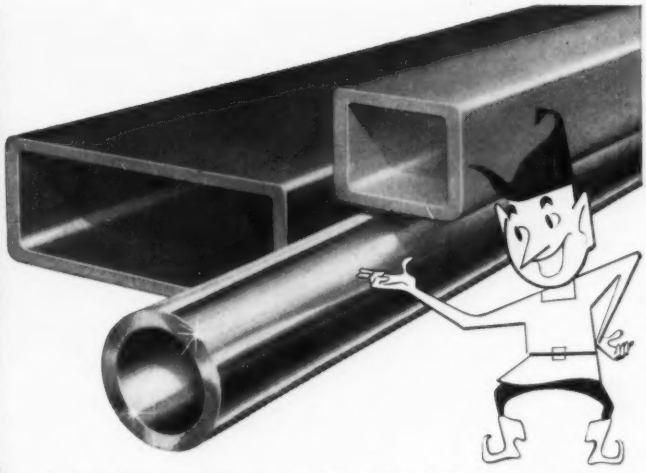
More Efficient—Other important facts about stainless condenser tubing were also discovered. It was found, for example, that the greater strength of stainless allows the use of lighter wall tubing with a more efficient heat transfer rate than heavy wall tubing. This strength also permits higher cooling water velocities in the tubes, increasing condenser vacuum and efficiency.

The resistance of stainless to erosion is very important. At high flow rates, stainless will hold up far better and provide longer service life. This is particularly true when cooling water contains silt or other debris.

How Stainless Compares







WELDED TUBING

CARBON STEEL – ALLOY STEEL – STAINLESS STEEL

joins

by any method

Welding and brazing qualities, easy machining and workability make welded steel tubing readily joined by any chosen method. Uniformity of wall thickness, concentricity, accuracy of dimensions and surface finish add the *plus factors* that no other kind of tubing can match. This exclusive combination of characteristics permits you to choose any accepted method of joining, applicable to the steel grade.

For easy "fit-up" and versatility there is nothing that can beat Welded Steel Tubing from a quality tube producer. This time specify Welded Steel Tubing.

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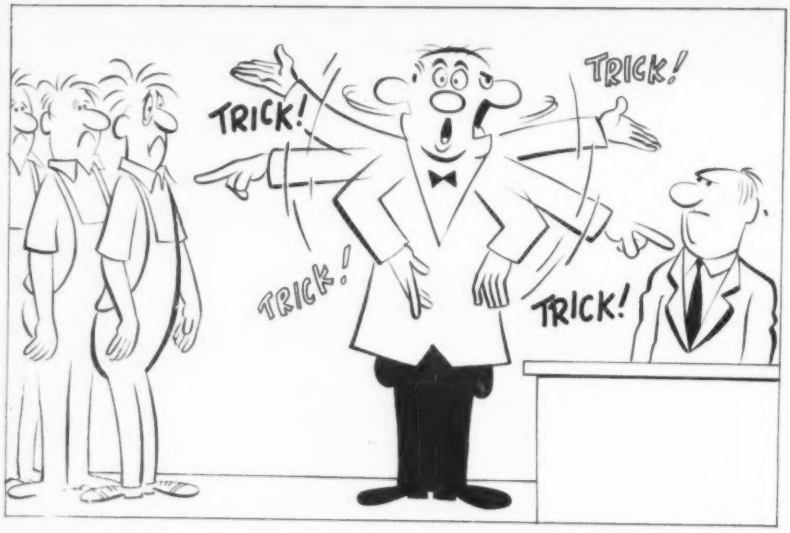


You Arbitrate It!

WERE THEY TRICKED?

From the files of
The American Arbitration Association

■ In negotiating a contract at a wire products plant, management and the union agreed that the established starting and quitting times wouldn't be changed "unless production or delivery requirements or extraordinary conditions require changes of hours for limited periods, in which case notice of such change will be given as far in advance as possible."

The ten employees in the shipping department were fairly certain, therefore, that their 6 am-to-3 pm shift wouldn't be changed. But a few months later, it became clear that there were times during the day when a few of the shipping clerks had nothing to do. Yet rush orders coming in late in the afternoon had to be done on an overtime basis or put off to the next day. So the company posted a notice to the effect that beginning the following month half the shipping-clerk employees would be on a 3 pm-to-midnight shift.

The union filed a grievance. "The contract doesn't permit changes in shifts except in emergencies," said the international representative. "This is just a trick to cheat the men out of overtime."

"Look at the contract again," answered the industrial relations director. **"It says we can change starting and quitting times in accordance with 'delivery requirements.' When our customers order supplies late in the day it requires us to oblige them."**

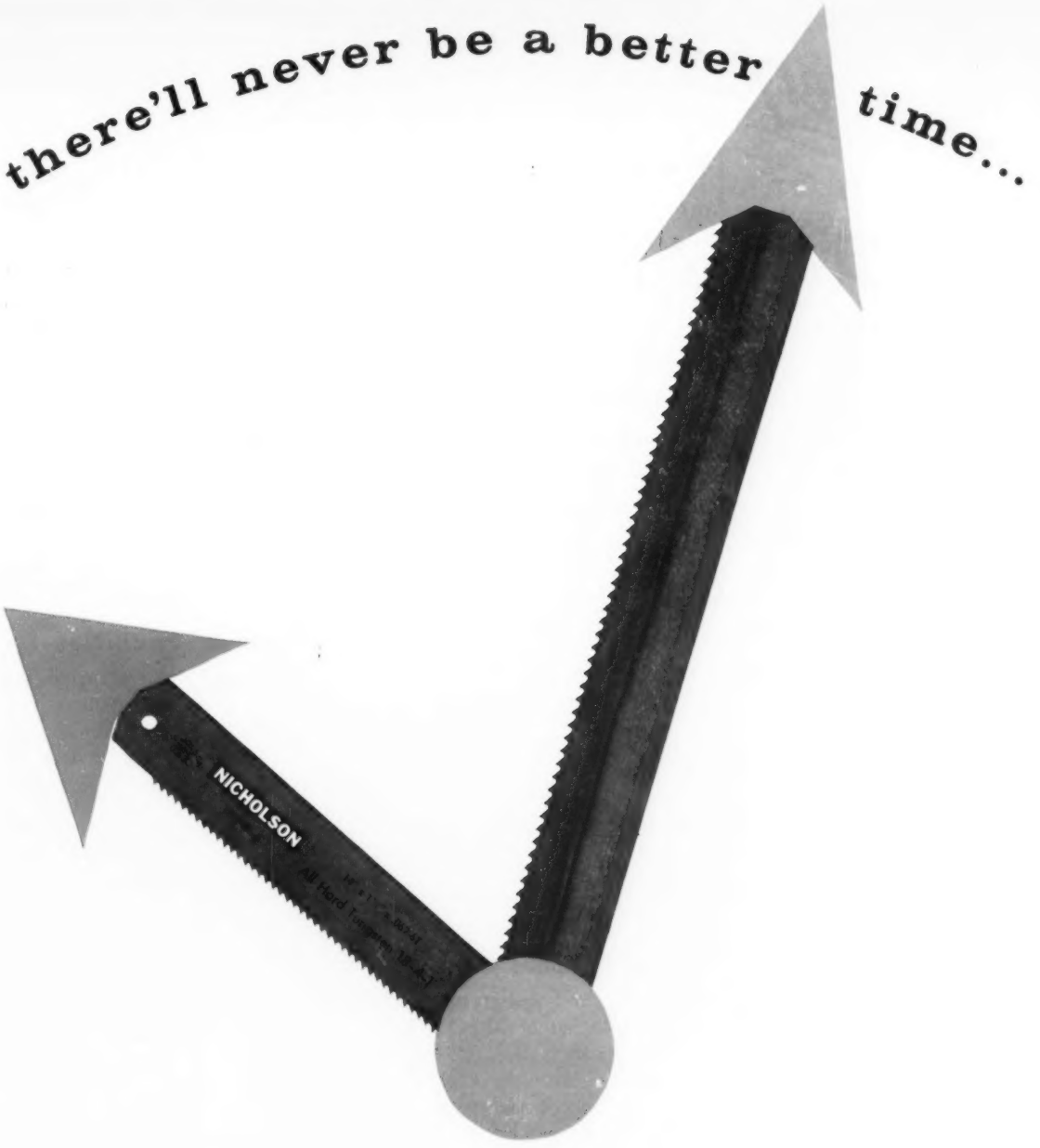
Eventually, the case went to arbitration under the rules of the American Arbitration Assn. **How would you rule?**

The Arbitrator Ruled:

He held that the change was made to secure a more economical distribution of manpower. But in view of the restrictions of the contract, he said the desirable aim was not by itself sufficient to justify the change, particularly as the conditions which prompted management to set up a new shift existed when the contract was negotiated.

CAUTION: The award in this case is not necessarily an indication of how arbitrators might rule in apparently similar disputes. Each case is decided on the basis of the particular history, contract, testimony and other facts involved. Some of these essential details may have been omitted in condensing the original arbitration for brief presentation.

there'll never be a better time...



for you to call your distributor of Nicholson or Black Diamond blades. Ask him for a first order of the blades you regularly use.

You'll like them. Not that we promise miracles. We don't. But we do promise that you'll get as fine a blade as money can buy. And not much money at that, considering the way we make them. The Nicholson or Black Diamond trademark never goes on our blades until our inspectors are positive they deserve it. And they're hard to please.

A good many industrial blade buyers and users have been using our blades for nearly a year now. Best gauge of the way they like them is the way they keep reordering them. Isn't it time for you to call your Nicholson or Black Diamond blade distributor? Never be a better time.

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 151.

Drill Manual

A 68-page catalog presents a complete line of drills, counterbores, countersinks, and sets. Also, 44 pages are devoted to the latest engineering information available on drills and drilling procedures, including the drilling of difficult-to-machine materials. (Cogsdill Twist Drill Co., Inc.)

For free copy circle No. 1 on postcard, p. 151

Spinning Cuts Costs

Spinning and hydroforming are shown to save up to 70 pct of tooling costs on short runs, odd shapes, and experimental work. Close tolerances not obtainable with other temporary tooling can be achieved —important in experimental aircraft and missile work. Facilities offered are completely described in a 12-page brochure. (J. Schrader Co.)

For free copy circle No. 2 on postcard, p. 151

Machinists' Tools

Tools most commonly used by machinists and toolmakers are listed in a new 48-page catalog. (Brown & Sharpe Mfg. Co.)

For free copy circle No. 3 on postcard, p. 151

Heavy Power Saw

A brochure describes the large cutoff capacity (24 x 24 in.) and operating ease of a new power saw. Power loading and runout conveyers are featured, as well as new systems for chip disposal, saw feed, drive and coolant. (The DoALL Co.)

For free copy circle No. 4 on postcard, p. 151

Aluminum Facilities

Facilities for design, engineering, drawing, stamping, spinning, assembly, welding, and finishing of aluminum are described in a 16-page brochure. (American Aluminum Co.)

For free copy circle No. 5 on postcard, p. 151

Pressure Switches

A 36-page design handbook and catalog features a complete line of pressure-actuated switches. A selection chart, and general operating, engineering, and service data are included. (Barksdale Valves)

For free copy circle No. 6 on postcard, p. 151

No-Corrosion Fasteners

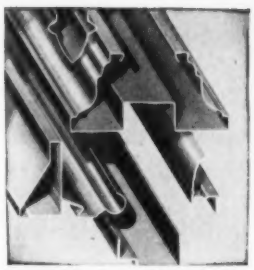
A comprehensive 24-page "Corrosion Guide" for fasteners provides information concerning corrosion of metal fasteners, and offers suggestions on metals to give longest service and life to products. (H. M. Harper Co.)

For free copy circle No. 7 on postcard, p. 151

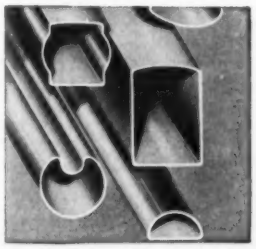
Horizontal Band Saws

A line of horizontal metalcutting band saws is described in a four-page folder and eight separate catalog insert sheets. (W. F. Wells & Sons)

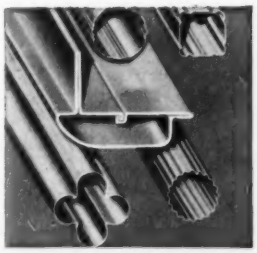
For free copy circle No. 8 on postcard, p. 151



SPECIAL SHAPES



WELDED TUBING



LOCK SEAM TUBING

TIGHT & OPEN SEAM

ANGLES & CHANNELS

IDEAS LIKE THESE

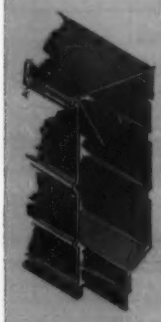
simplify design, increase production, reduce cost!

Look at the variety and versatility of these shapes, then take a closer look at your product. Maybe it could be made faster, better and at a lower cost with Van Huffel shapes . . . roller die, cold formed to any lengths from a wide variety of metals: hot or cold rolled steel, stainless steel, high strength steels, coated steels, copper, brass, aluminum, etc., from coiled strip ½" to 33" wide; in gauges from .003 to .312; from forming dies designed and built in our own plant.

WRITE FOR THESE FREE HANDBOOKS

32 page Welded Tubing Handbook, contains sizes, gauges, tolerances and other engineering data in handy reference form.

48 page handbook explains basic principles of Roller Die, Cold Formed shapes and shows dozens of ideas that have taken shape.



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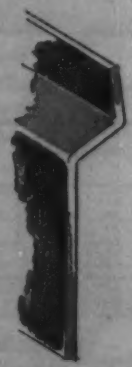

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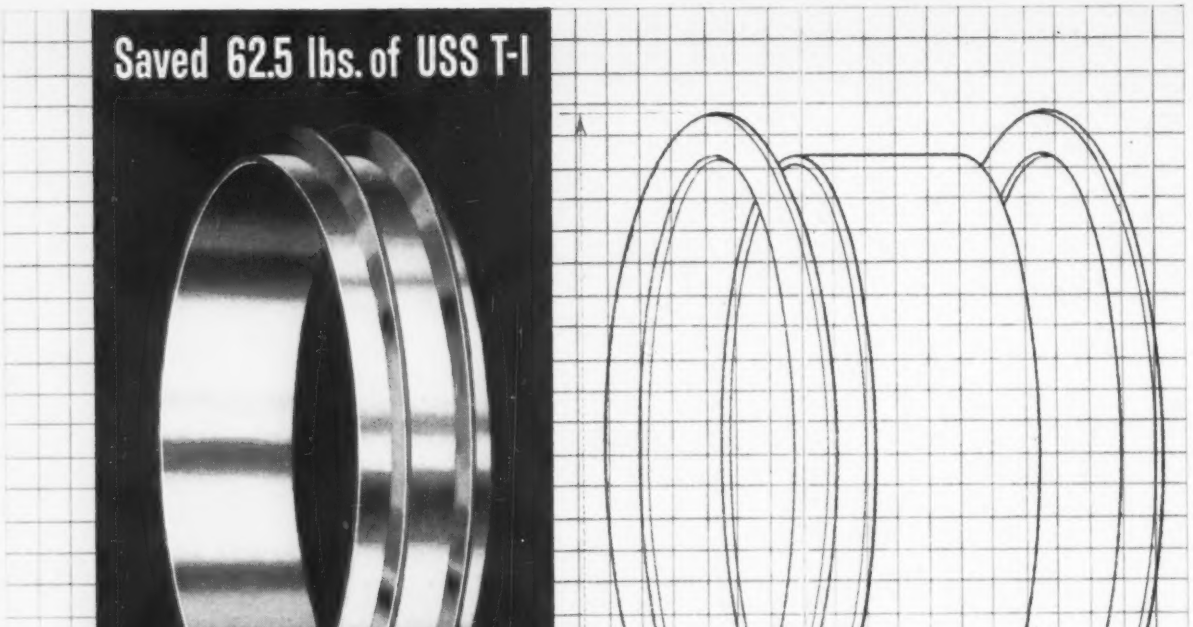

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By circumferentially welding two flash butt-welded rings around a flash butt-welded band, Amweld engineers eliminated a bulky forged ring and hours of machining. The finished part, a sway brace ring for a jet engine, met manufacturer's critical requirements for aircraft use.

Savings like these have been effected on a wide variety of aircraft and missile parts, particularly where high-strength, high-temperature alloys were involved.

Amweld's 41 years of fabricating experience are backed by extensive welding, forming and machining facilities. We will be happy to study your problem and to handle subcontract work on either prototype work or production orders.

GET THE FACTS ABOUT AMERICAN WELDING

Complete information. Facilities brochure, Precision Assemblies Catalog, and booklet on "How Flash Butt-Welded Rings are Made."

THE AMERICAN WELDING & MFG. CO. • 120 DIETZ ROAD • WARREN, OHIO

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These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Aluminum-Bronze Dies

An illustrated eight-page bulletin describes the advantages of aluminum-bronze forming and drawing dies. Three grades of metal for dies are fully described, and suggestions are offered on the proper "run-in" and general use of the manufacturer's metal dies, as well as on correct machining procedures of the die alloys. (Ampco Metal, Inc.)

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Chisels

Chisel styles for pneumatic chipping hammer, scaling hammer, and hand use are illustrated in a two-page product bulletin. Standard types of safety-retainer shanks and point styles are shown with related dimensional data. (Bedford Tool and Forge Co.)

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Wire and Strip Forming

A four-page guide on wire forming, strip forming, and cold heading and threading includes design suggestions on how best to get lower wire products part costs. Facilities for performing these operations on wire and strip products are offered. (Robertson Steel & Iron Co.)

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End Mills

A manufacturer of end mills and special cutting tools offers a catalog including several new heavy-duty, ball, and other end mills. (Arrow Tool & Reamer Co.)

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Tool-Holder Bushings

Complete specifications and prices for split and solid types of tool-holder bushings, in a wide range of bore sizes, are contained in a data sheet. (Gahr Machine Co.)

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Wire-Cutting Machine

A wire straightening and cutting machine is designed to deliver uniform lengths of straight, precision-cut wire at variable speeds up to 300 fpm. A chain feed insures positive feed and eliminates twist. (The Vaughn Machinery Co.)

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Heavy-Duty Fork Trucks

Fork trucks with 12,000- to 20,000-lb capacities are illustrated and described in a six-page folder. (The Elwell-Parker Electric Co.)

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Oilless Bearings

A bulletin describes a new alloy-of-plastics bearing material with a number of desirable performance characteristics. Bearings made of this material can be molded to any shape and close-tolerance machined, and will not cold-flow or melt. (Arguto Oilless Bearing Co.)

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Lubricant Selector

A lubricant selector chart facilitates the choice of proper lubricant for any high-pressure lubrication job. Included are specifications and application recommendations on the company's entire molybdenum-disulphide - additive lubricant line. (The Alpha-Molykote Corp.)

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Silicone Products

A line of silicone products and their uses are briefly described in an eight-page catalog. Included are hydraulic and other fluids, lubricants, and insulation. (Silicone Product Dept., General Electric Co.)

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Tape Control

The advantages of tape control positioning are described, and ap-

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FREE LITERATURE

plications to drills, boring mills, and punch presses are illustrated, in a 10-page brochure. Packaged positioning units for fitting to older machinery are offered. (Jones & Lamson Machine Co.)

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Traveling Cranes

Engineering data on a complete line of overhead electric traveling cranes is supplied in a pamphlet. (Northern Engineering Works)

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Centrifugal Castings

Special advantages offered by a line of centrifugal castings are outlined in a brochure, which illustrates some new and critical applications, including unfired pressure vessels and atomic power components. (Sandusky Foundry & Machine Co.)

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Sprockets and Chains

Full details on a line of 1300 stock sprockets and various types of roller chains, along with technical data and chain-drive engineering information, are included in a comprehensive catalog. (Cullman Wheel Co.)

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Special Machines

A bulletin covers some special air and hydraulic machines produced by a specialist in these lines. This manufacturer makes special air or hydraulic operated machines to press, burnish, assemble, form, size, position, shear, and load. (Logansport Machine Co., Inc.)

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Punch Press

A product bulletin describes a new model, 10-ton air-hydraulic press and all tooling and accessories thereto, including a gaging system for accurate location of holes and notches. (Punch Products Corp.)

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Recording Controllers

A line of continuous self-standardizing strip-chart recorders and recording controllers for measuring electrical and process variables, is described in a 12-page product bulletin. Using servo measuring systems, the instruments record accurately and also operate a variety of control devices. (General Electric Co.)

For free copy circle No. 25 on postcard

Small Carbide Reamer

Announced in a brochure is a carbide miniature reamer. Single-edged, it can be quickly and easily honed to size. Negative rake provides a slight burnishing action. Standard sizes are 1/16- and 1/32-in. diam with other sizes on request. (Microtron, Inc.)

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Fitting Bearings

"Keys to Bearing Fits," an eight-page manual, advises how to prevent premature bearing failures and removals and how to obtain accurate bearing fits easily and economically, and provides engineering data insuring perfect bearing fits on all anti-friction bearings. (Bearing Inspection, Inc.)

For free copy circle No. 27 on postcard

Seamless Steel Tubing

A 14-page tubing and facilities catalog describes carbon and alloy seamless steel tubing in mechanical, pressure, and aircraft grades. Major steps in seamless tube production are shown. Special shapes are covered. (Ohio Seamless Tube Div. of Copperweld Steel Co.)

For free copy circle No. 28 on postcard

Loam-Molding Products

A brochure illustrates facilities for loam molding, and some typical products of the art. (Kutztown Foundry & Machine Corp.)

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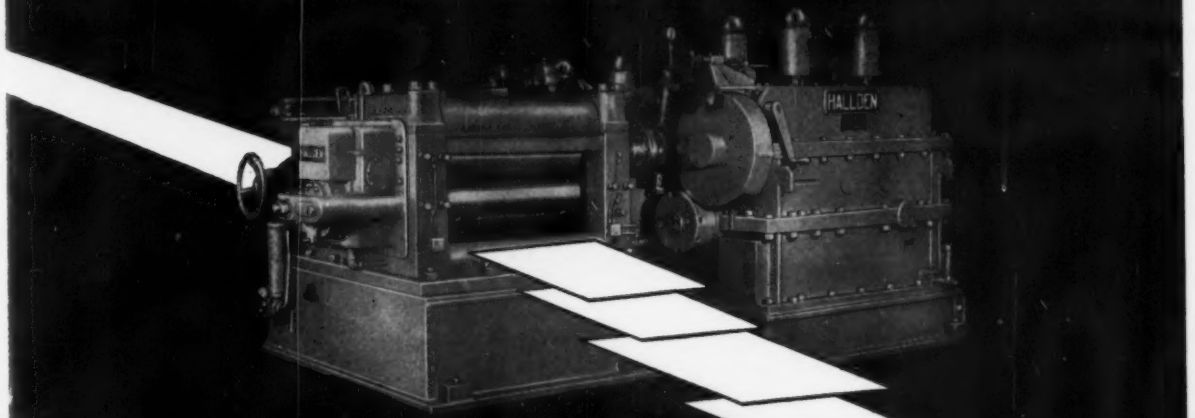
NOW - A NEW "Push Button" FLYING SHEAR

NO DOWN TIME to change cut length or synchronization



A HALLDEN SHEAR EXCLUSIVE

A major improvement in high production continuous strip process in-line shearing.

Revolutionary new designs now permit synchronization adjustment AND gear changes to be made without stopping production. Changes in cut lengths are made in just seconds.

Hallden Shears can be furnished in processing lines built by leading machinery manufacturers the world around.

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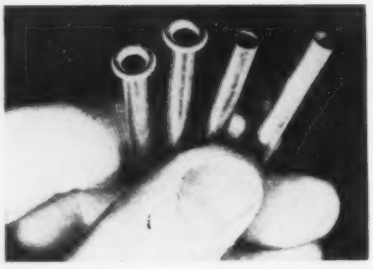
THE SHEARING SPECIALISTS

THE HALLDEN MACHINE COMPANY • THOMASTON, CONNECTICUT

Associates: The W. H. A. Robertson & Co. Ltd. Bedford, England

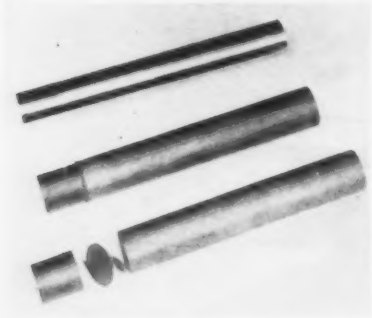
New Materials and Components



Savings Come with Eyelets Made from Tubing

A line of tubular eyelets up to ½-in. OD and any desired lengths is offered. The manufacturer has found that such eyelets can be produced at much lower costs than drawn eyelets for lengths over 1 in., the savings increasing with length. Cost savings result from lowered tooling costs. Sizes are controlled by use of precision tubing. Rolled, flared, or beaded ends can be supplied. (H & H Machine Co., Inc.)

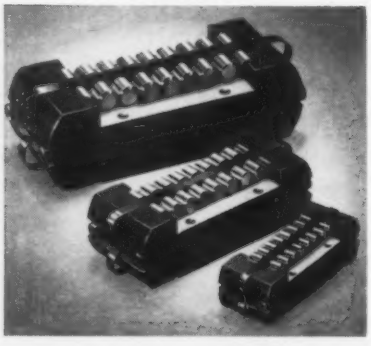
For more data circle No. 58 on postcard, p. 151



Powder-Metal Wafer Bonds Carbide to Steel

A new process for joining carbide to steel or other metals makes a very powerful bond. The process is simple and can be used where carbide tipping has before been considered impractical. The wafer is inserted between carbide and steel, and the joint heated by welding torch or induction coil for one minute under 500-psi pressure. A rapid diffusion of the interfaces makes the bond. Flux is eliminated. After joining, the tool can be finish-ground, if desired. Since this alloy is heat-resistant, heat-treatment can be applied to the tool subsequent to joining. Samples are available. (Powder Alloys Corp.)

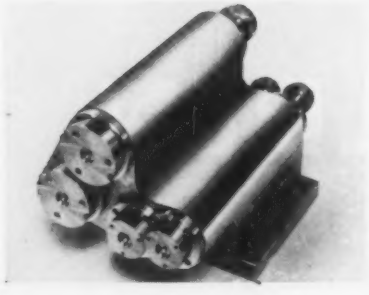
For more data circle No. 59 on postcard, p. 151



Roller Bearing for Linear Positioning Uses

Recently introduced is a recirculating roller-type bearing for friction-free linear positioning. Unlimited travel and freedom from stick-slip provide more precise movement of heavy machine elements requiring high accuracy. Flat, compact design and the recirculating principle spread heavy loads over a larger surface. Preassembled, modular construction of 52100 bearing steel permits mounting directly on precision flat surfaces, eliminates hand fitting of slides and costly way shaping, and insures long bearing life and operational accuracy. It easily adapts to many uses. (Scully-Jones and Co.)

For more data circle No. 60 on postcard, p. 151



Cluster Spindles Up Accuracy, Lower Cost

Cluster spindle systems improve accuracy at reduced cost in producing housings, pump bodies, gyro frames, and similar parts. Multiple or cluster spindles provide close and unvarying tolerances between centers in mass-production. A workpiece moving between two clusters can be multi-processed on both sides, in exact register, with only one setup. Centers can be located very close together without sacrifice of ruggedness. Consulting service is offered. (The Whitnon Mfg. Co.)

For more data circle No. 61 on postcard, p. 151

IT'S ELECTROMANGANESE® IN THE STRETCH

When you make deep drawing quality steel avoid the harmful effects of silicon *and* carbon by standardizing on *pure* manganese—ELECTROMANGANESE®. No carbon, no silicon, no other obnoxious impurities. What you need is what you get. Write for Bulletin 201 and price list to Technical Literature Section, *Foote Mineral Company, 438 Eighteen West Chelten Building, Philadelphia 44, Pa., or Box 479, Knoxville 1, Tenn.*

FOOTE
MINERAL COMPANY

DESIGN DIGEST

Auto-Manual Control

A full line of auto-manual control valves is announced, designed for automatic interlocking of manually-controlled circuits or to permit manual operation of an automatically-operated system. The valve can prevent out-of-sequence or accidental manual actuation of a

machine. In normally-automatic circuits, it permits manual operation for machine setup, or in emergencies. Of dependable design and rugged construction, it is available with 2-, 3-, or 4-way valve body, for use in oil, air, or vacuum service. (Valvair Corp.)

For more data circle No. 62 on postcard, p. 151

Shaft-Mounted Reducers

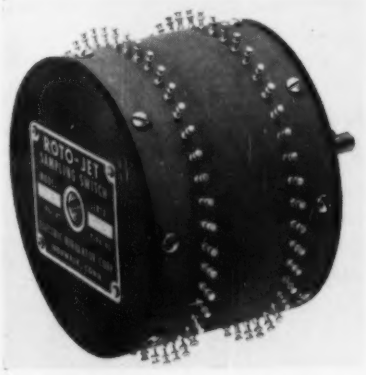
Recently announced is a line of shaft-mounted speed reducers designed for quick, easy installation to the driven shaft and requiring a

minimum amount of mounting space. They use standard V-belts and are equipped with a torque arm which permits easy, infinite belt ad-

justments. Each unit may be operated over a wide range of speeds by using a variable-pitch pulley, or by changing sheave combinations. Available in single- and double-reduction units, they offer as optional equipment a built-in backstop which prevents reverse rotation. Automatic overload protection is also available. Capacities range from 1 to 40 hp, with single-reduction gearing, with output speeds from 90 to 420 rpm; double-reduction units range from 1 to 30 hp, with speed ranges from 10 to 160 rpm. Flange-mounted type with double-reduction gearing is also available with capacities from 1 through 7 hp.
(The Lima Electric Motor Co.)
For more data circle No. 63 on postcard, p. 151

Sampling Switch

Capable of making more than 3600 closures per second is a noiseless sequential sampling switch. It is actuated by a rotating jet of air. Signals of millivolts can be transmitted free from noise without amplication or filtering of any kind. Uses lie with thermocouples, strain gages, and complex process control systems. (Electric Regulator Corp.)



For more data circle No. 64 on postcard, p. 151

Special Wrought Iron

A specialty wrought iron with better impact and low-temperature properties than most steels is announced. It is intended for uses in low-temperature designs where brittle failure poses engineering problems. Highly deoxidized, with lowered phosphorous and carbon content, it is alloyed by the addition of 1 pct manganese. It has excellent

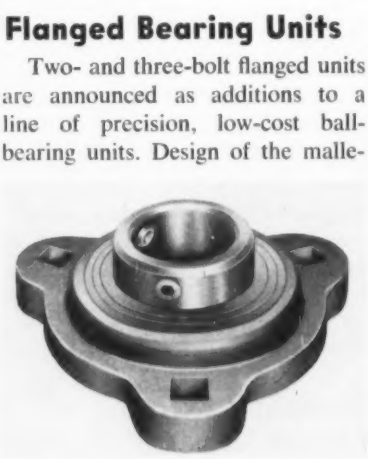
DESIGN DIGEST

corrosion resistance, weldability, and workability. It is available in tubular and flat rolled forms. (A. M. Byers Co.)

For more data circle No. 65 on postcard, p. 151

Flanged Bearing Units

Two- and three-bolt flanged units are announced as additions to a line of precision, low-cost ball-bearing units. Design of the malle-

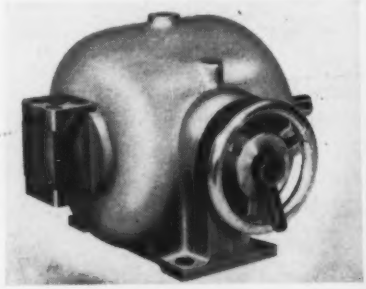


able housing permits either flush or recessed mounting. The units come pre-lubricated for long life in standard sizes from ¾ to 1 7/16 in. (Sealmaster Bearing Div., Stephens-Adamson Mfg. Co.)

For more data circle No. 66 on postcard, p. 151

Hydraulic Pumps

Variable - volume radial piston pumps, with a complete line of controls, are offered in a new line in 18-, 50-, and 200-gpm sizes, all rated at 3000 psi and capable of



5000 psi maximum. They feature a variety of high-pressure design innovations, positive control, long life, economy, and durability. (Texas Hydraulics, Inc.)

For more data circle No. 67 on postcard, p. 151

Plumbago

A brand-new plumbago is made from a newly discovered graphite

Chemical energy provides direct current

Power is furnished by a fuel cell in the Allis-Chalmers Research Laboratories. It points the way to remarkably efficient means of energy conversion in the future.

Unlike the conventional storage battery, the fuel cell converts the chemical energy of gases (at room temperature) directly into direct current. For the future the fuel cell promises a highly efficient source of power.

Fundamental research of this type serves *two* end results at Allis-Chalmers: 1) enables design engineers to make equipment even better; 2) helps every industry achieve new efficiencies and economies.

Research is only one area where A-C helps. Single-source availability of "teamed" equipment, maximum engineering assistance and outstanding service facilities are others. For more information, contact your A-C representative, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

Plan to stay ahead... MODERNIZE!

Products for industry Electrical Generation, Distribution and Utilization Equipment; Pumps; Compressors; Mechanical Power Transmission Equipment; Processing Machinery; Motors and Control; Water Conditioning Systems, plus Materials Handling Equipment.

A-C ALLIS-CHALMERS

A-1010-GI

Fuel Cell, being researched by Allis-Chalmers, converts chemical energy of hydrogen, oxygen or other gases into direct current. It operates with minimum maintenance and is unaffected by temperatures.

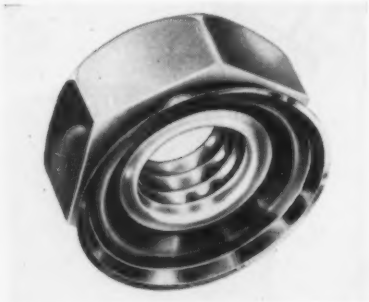
DESIGN DIGEST

with superior characteristics. It is rich and smooth, and will adhere well when rubbed or brushed on green sand molds. It is recommended as a mold coating, a mold wash, a core wash to increase heat resistance, or an additive to sand to give heat resistance. (Frederic B. Stevens, Inc.)

For more data circle No. 68 on postcard, p. 151

Nut-Washer Fastener

Preassembled to combine a spring washer with a hex nut, a new fastener is available. The flared washer makes for easy starting on bolts and provides reactive spring pressures.



It does not mar the surface to which it is applied, and it can be filled with mastic where liquid-tight assembly is desired. (Reliance Div., Eaton Manufacturing Co.)

For more data circle No. 69 on postcard, p. 151

Indicating Controllers

Two electronic instruments quickly and accurately indicate, or indicate and control, any variable convertible to an electrical quantity, such as dc potential, current, or resistance. These self-balancing potentiometer and bridge type instruments are suitable for most industrial purposes, and have exceptional sensitivity and stability. Both units will check any of several hundred sensing elements. A large selection of standard scales is available, and instruments can be equipped with either 2- or 3-position front set controls. (Thermo Electric Co., Inc.)

For more data circle No. 70 on postcard, p. 151

Castable Refractory

A new castable refractory has a

INSULATION RESISTANCE — MEGOHMS

New insulation adds years to motor life

Super-Seal motors withstand abrasion, physical stresses, moisture, heat aging

A drip-proof enclosure is usually all you need with the remarkable new insulating systems and advanced mechanical features of *Super-Seal* motors.

New motors are protected with the *Silco-Flex* stator coil insulating system: A homogeneous dielectric barrier of vulcanized silicone rubber possessing unmatched resistance to abrasives, moisture and most corrosive or chemical atmospheres.

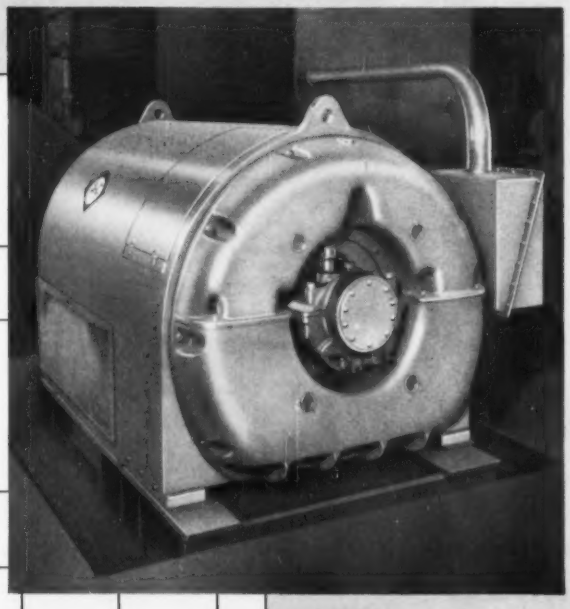
Synchronous machines have *integrated* field coils that seal against contaminants . . . bond and lock against mechanical forces.

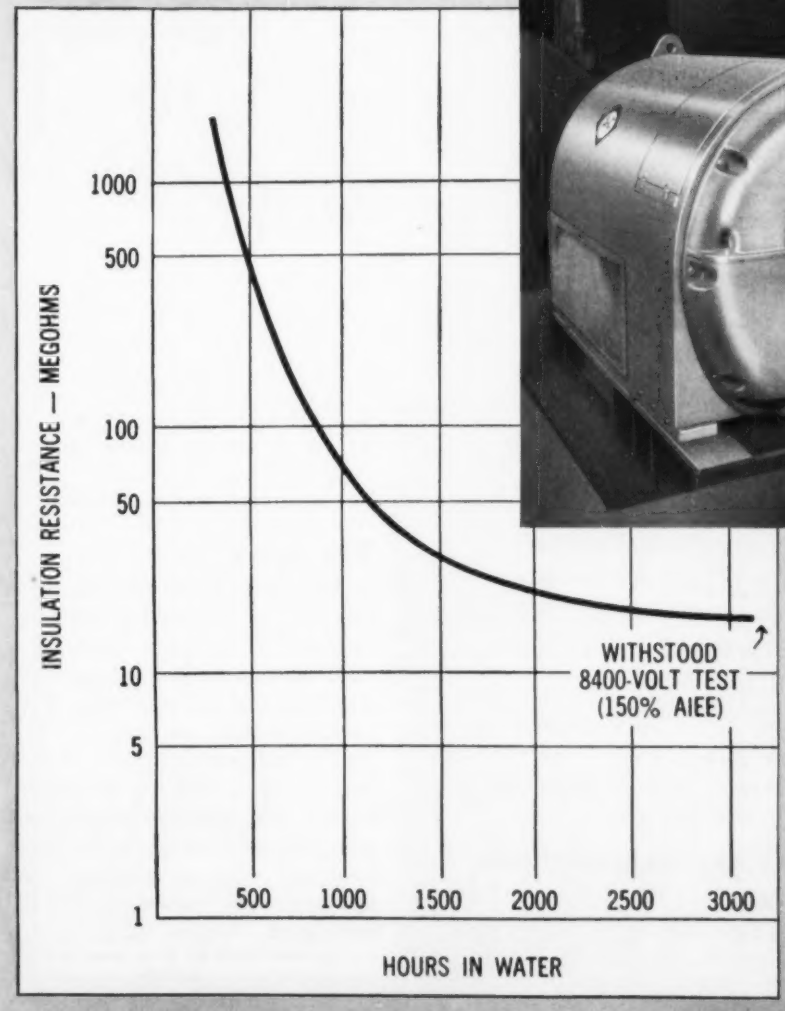
Contact your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

Super-Seal and Silco-Flex are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-5922-MW





Silco-Flex Insulation | Polyester Mica Tape | Asphaltum Mica Tape

Sandblasting proves the difference! Only *Silco-Flex* insulation stood up after one minute using 90-grit aluminum oxide and 100-psi air from distance of 6 inches.

Chart shows insulation resistance in water of a 2300-volt *Silco-Flex* insulated coil, completely immersed with 2300 volts applied continuously.

DESIGN DIGEST

high service temperature limit and excellent resistance to abrasion and chemical attack. With a fusion point of 3280°F, it has exceptional strength through a temperature range to 3000°F. Mixed with water on the job, it sets hydraulically. A separate formulant is available for pneumatic use. (Plibrico Co.)

For more data circle No. 71 on postcard, p. 151

Adjustable Speed Drive

A line of packaged adjustable speed drives has been introduced. Available from ¼ to 25 hp (ac) in a wide variety of speed ratios, they operate on the V-belt connected, adjustable variable - pitch pulley

principle. They feature ease of maintenance, smooth stepless control, and a wide variety of control accessories. Output speeds vary from 5 to over 4000 rpm, with standard speed variations of 2, 3, 4, and 5 to 1. (General Electric Co.)

For more data circle No. 72 on postcard, p. 151

Die Alloy

An aluminum bronze die alloy for drawing and forming stainless steel and other clean metals, has been developed. It is tough, with improved impact resistance, high as-cast hardness, improved machinability, and great resistance to wear and abrasion. Galling, scratching, loading, and pinching are eliminated with this alloy, die life is increased, finishing costs are lowered, and downtime for redressing dies is minimized. (Ampco Metal, Inc.)

For more data circle No. 73 on postcard, p. 151

CORRECT APPLICATION is the key to semi-conductor rectifier efficiency

Sure, you're looking for the high conversion efficiency, low maintenance and simplified operation associated with semi-conductor rectifiers. And you'll get all these advantages — and more — if the semi-conductor rectifier is a right-for-the-job installation.

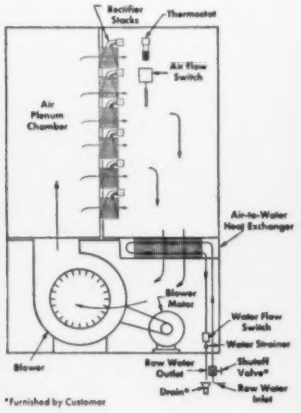
Your local Allis-Chalmers man will be glad to tell you whether *or not* a semi-conductor rectifier is best for your specific operation. He can afford to be completely unbiased in the approach to your problem because Allis-Chalmers makes *all types* of power rectifiers. At his disposal, and yours, are vast research and engineering facilities. Behind his recommendations is the assurance found in the fact that Allis-Chalmers has been developing, building and applying rectifiers for almost 25 years.

For complete information, call your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. In Canada, write Canadian Allis-Chalmers Ltd., Box 37, Montreal, Quebec.

ALLIS-CHALMERS

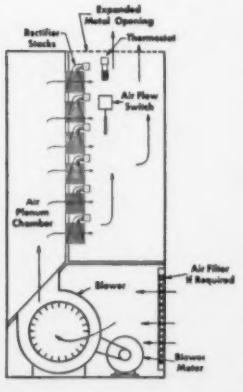
A-5950-MW

CHOICE OF COOLING SYSTEMS

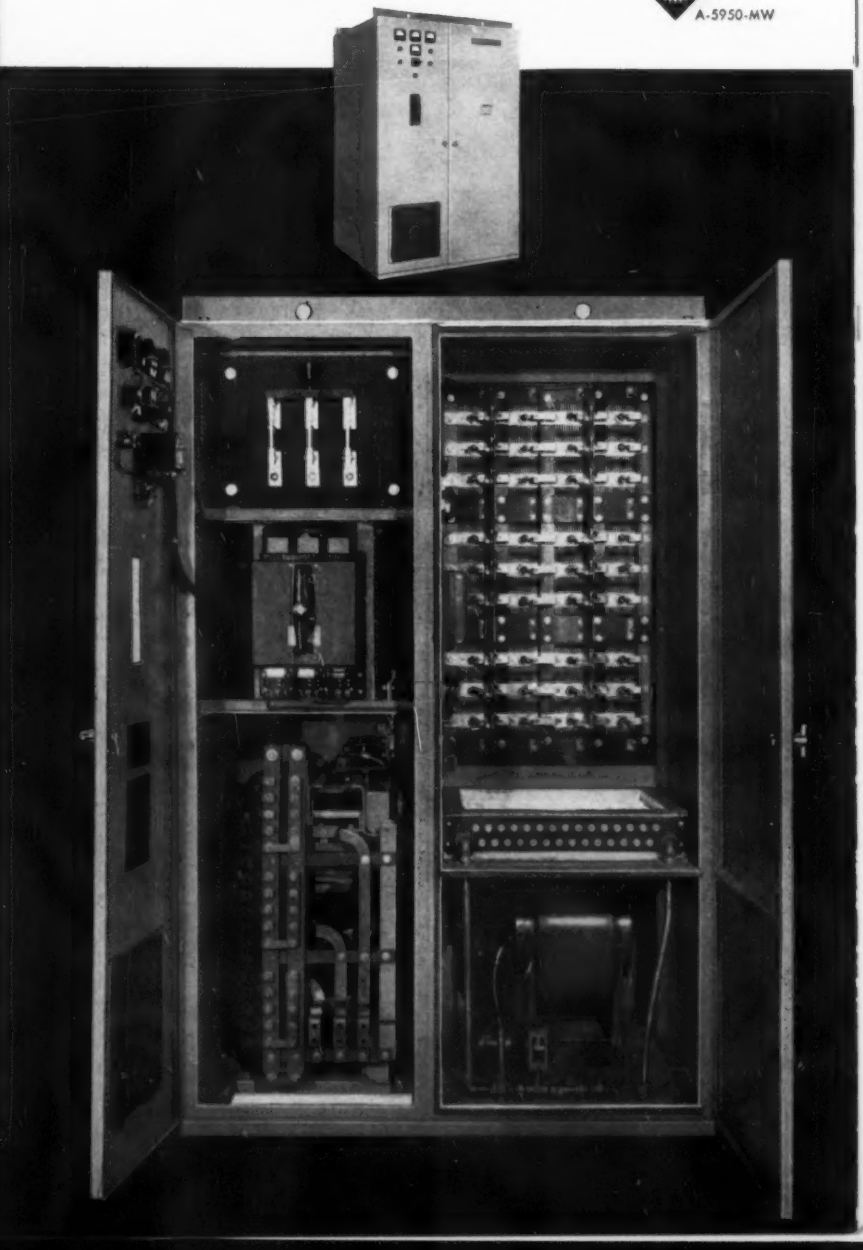


*Furnished by Customer

A recirculating air system featuring an air-to-water heat exchange is employed where atmosphere is corrosive or dusty.



A simple air-cooling method is recommended for use in near normal atmospheres and where water is not available.



New Equipment and Machinery

Centerless Grinder for Small Bearing Races

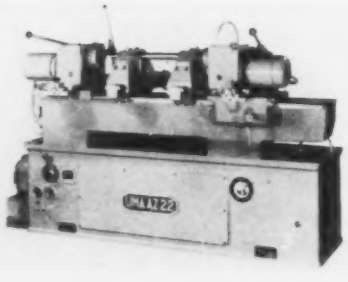
A centerless internal grinding machine can grind inner races of bearings as small as 0.040 in. to 0.00015 - in. tolerance and 5 - microinch finish in a fully automated 15-second cycle. Automatic loading, part sizing, and ejection, plus simplified tooling for easy changeovers, are also featured. The part is rotated with its OD held with hard shoes against a rotating plate, assuring squareness of bore to face, while a high - speed electronically controlled wheel reciprocates back and forth and feeds in to remove metal. (The Heald Machine Co.)

For more data circle No. 74 on postcard, p. 151

Data-Processing Speeds Numerical Control

A highly advanced system of numerical-control equipment has recently been put into operation to prepare directions for completely automatic, numerically controlled machine tools. It converts punched-tape information into magnetic instructions at speeds of four times reel time and 16 times faster than was previously possible. Savings of from 30 to 60 pct have been realized on parts machined on numerically controlled skin mills and profile mills. This system can produce sufficient tape for over 20 machine tools. (Giddings & Lewis Machine Tool Co.)

For more data circle No. 75 on postcard, p. 151



Faces, Centers, to Prepare Tracer-Lathe Work

The new UMA fully automatic end-facing and centering machine, Model AZ22, manufactured in West Germany, is available in the U. S. It comes in sizes from 40 to 100 in. between centers. Workpiece blanks are prepared automatically after loading. Opposite right-hand milling cutters face the ends to obtain uniform piece length, and then the centers are inserted. Milling speeds can be preselected and coupled to a suitable speed of the centering drills. (Columbia International Corp.)

For more data circle No. 76 on postcard, p. 151

Combination Broach Design Cuts Costs

A new concept in broach design can cut the cost of producing precision internal spur and helical gears and splines up to 50 pct. It makes use of a combination roughing broach and removable shell-type finishing section that enables ultra-smooth, precision gears or splines to be produced in a blank in a single operation. Formerly two operations were required, and even then the surface finish did not compare with that obtained by this new method. A cost-saving advantage is that the removable shell-type finishing section can outwear three roughing sections. The new tool has already been widely accepted in the automotive and aircraft industries, and wide applications in the metalworking industry are envisioned. (National Broach & Machine Co.)

For more data circle No. 77 on postcard, p. 151

An open motor did what no other motor could... in a mudbath

This Super-Seal motor with *Poxeal* insulation and protected bearing was not fouled by mud. An Allis-Chalmers customer, in a frequently flooded area, required a motor that could readily start even after prolonged immersion in mud.

The "dirtiest mud available" was used in conducting the successful tests in the A-C Motor Laboratories.

Motor user requirements like this form the basis for A-C pioneer-leadership in motor development. Motor buyer needs *created the most complete line of integral-horsepower motors in industry.* Induction, dc, wound rotor, synchronous, gear, tube-type and *Synduction* motors, and now *Super-Seal* motors! And, if these lines don't fill your need, A-C engineering excels in special design.

You can benefit from this pioneer-leadership by contacting your A-C representative or distributor. For more information, write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Super-Seal, Poxeal and Synduction are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-1005-G1

NEW EQUIPMENT

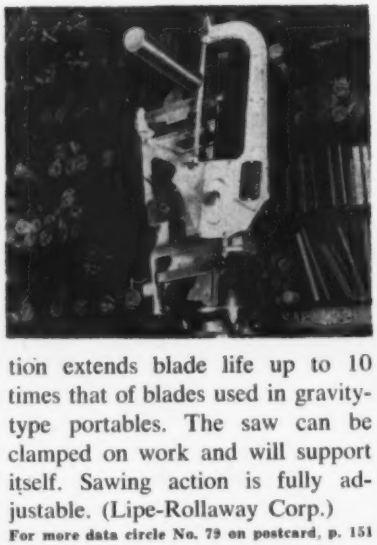
Long Press Brake

Longest machine yet in a line of hydraulic press brakes will cut mild steel plate up to 20 ft by 5/16 in. The ram is driven by two hydraulic cylinders leveled by electronic control. The machine is flexible and fast in operation; ram travel and return can be fast, and operating pressure can be simply adjusted. It cannot be damaged by overloading, as the ram will stop without harm to the machine. It is rated at 500 tons. (The Cleveland Crane & Engineering Co.)

For more data circle No. 78 on postcard, p. 151

Handy Power Hack Saw

Precision and speed are combined in a portable power hack saw, which cuts anything from 3 x 3-in. steel to thin-wall tubing with 0.005-in. tolerance. It can save time by cutting off material where it is stored. Its draw-cut, lift-return action extends blade life up to 10 times that of blades used in gravity-type portables. The saw can be clamped on work and will support itself. Sawing action is fully adjustable. (Lipe-Rollaway Corp.)



For more data circle No. 79 on postcard, p. 151

"Bottoming" Bar

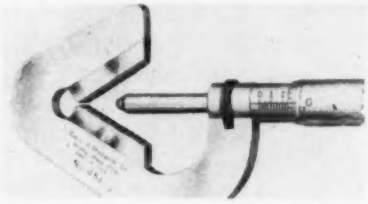
A bottoming bar finishes hole walls and bottoms to close tolerances with excellent finishes. Twin opposed cutter blades are adjustable to up to 0.300-in. expansion. A floating mount permits lateral movement of the cutters, equalizing chip load and permitting the blades to

center themselves to the bore, resulting in extremely fine finish and exact bore diameter. The bar cannot perform full bottoming since, in expanded position, a small gap exists between the two cutter blades. It will, however, square off internal shoulders, cleaning up bottoms to within a small distance from center. Sizes for holes from 1 to 5 in. ID are available. M-3 HSS cutters are standard, with carbide-tipped cutters available. Other sizes will be furnished on special order. (Robert H. Clark Co.)

For more data circle No. 80 on postcard, p. 151

V-Anvil Micrometer

A V-anvil micrometer checks out-of-roundness and measures odd-fluted cutting tools. Conventional two-point micrometers, which check diameter only, will pass deceptive errors. The three-point contact of



this instrument enables it quickly to detect out-of-round of workpieces or any three-fluted cutting tools. (A companion micrometer measures five-fluted cutters.) Carbide faces and satin-chrome finish are featured. (The L. S. Starrett Co.)

For more data circle No. 81 on postcard, p. 151

Shear Dual Measuring

The combination of electronic surface measuring and positive mechanical measuring in a shear line now gives extreme flexibility in processing coil stock to sheets. The manufacturer has found surface measuring to eliminate minimum and maximum length restrictions, and mechanical measuring to have minimum and maximum length restrictions. The availability of both methods, each with its own advantages, overcomes limitations formerly encountered when using a shear line with only one method of measuring. Surface measuring, better for light gages, eliminates min

and max length restrictions and allows instantaneous length changeover. Mechanical measuring, preferred for heavier gages, has min and max length restrictions, but is now accomplished quickly through a motorized screw arrangement with direct reading to a decimal counter. (Dahlstrom Machine Works, Inc.)

For more data circle No. 82 on postcard, p. 151

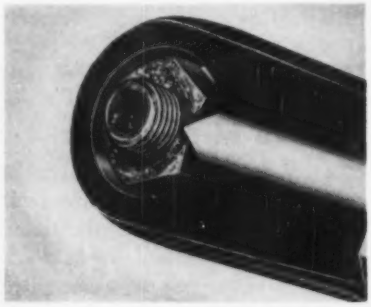
Checks Tin Plating

An electric stripping machine quickly and accurately determines the quality of tin plating. In a few minutes it can check the coating weights on tin on tin plate—both the free tin and the alloyed tin—and the amount of oxide film on tin plate. It electrically strips off the free tin and alloyed tin from a sample of known area. Weights are calculated in accordance with electrical laws, based on the amount of current used in the operation. (Atomatic Mfg. Co.)

For more data circle No. 83 on postcard, p. 151

Removes Frozen Nuts

A nut-busting kit is available for foolproof removal of frozen or rusted nuts without damage to bolt or threads. A tool steel blade is driven by a hex bolt into the nut to split it quickly and easily for



fast removal. The kit includes two cast-steel bodies, with ¾- and 1 3/16-in. openings, a chrome-moly tool steel cutter with hex driving bolt, and carrying case. It is low-priced. (Burroughs Tool & Equipment Corp.)

For more data circle No. 84 on postcard, p. 151

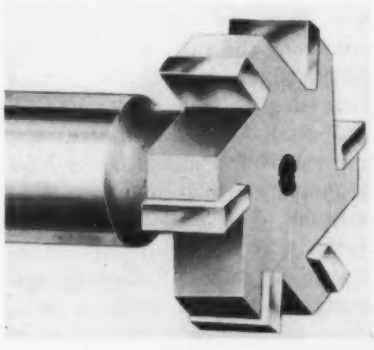
Carbide Inserts

Reconditioned carbide throwaway inserts afford savings up to 50 pct. They are completely ground on all surfaces and can be supplied in any quantity, grade, or shape. (Carbide Ceramic Products)

For more data circle No. 85 on postcard, p. 151

Carbide Mill Cutters

A line of carbide Woodruff Key-



seat Cutters in sizes from ½- to 1½-in. diam is available. They are

THE BEAUTY OF utility

The Stainless Steel products illustrated are made by STEELEX Corporation, Williamsport, Pa.

in Superior Stainless STRIP STEEL

SERVICE-ABLE Superior Stainless performs handsomely in these functional utensils—always bright, easy to clean, with extra strength for extra years of use. • Superior Stainless delivers handsome performance in fabrication, too . . . handles *right* because of superior quality control at every stage of manufacture. • We have much to offer in technical assistance. Write us on your stainless applications.

SUPERIOR STEEL DIVISION

OF

COPPERWELD STEEL COMPANY

CARNEGIE, PENNSYLVANIA

For Export: Copperweld Steel International Company, New York

WHEELABRATOR® cleans structurals faster and cleaner, at lower cost

Two important things are wrong with wire brushing structural steel to remove rust and scale. First, it's too slow and costly to be tolerated in an efficient operation. Second, it doesn't get the steel clean.

Where blast cleaning is required prior to fabricating, galvanizing, or painting structurals, Wheelabrator airless blast cleaning will cut your costs and give you important additional advantages.

Wheelabrator Cabinet installed at a prominent Canadian firm for descaling a wide range of structural steel members and steel plate. Advantages of Wheelabrator descaling are: increased and lower cost production, a cleaning versatility that has led to faster deliveries, and more effective and longer-lasting paint adherence.

The wasteful process of wire brushing is entirely eliminated. Any degree of cleaning can be achieved, down to virgin metal, if desired, giving you complete control over the cleaning process. Paint or other coating adheres tenaciously to the scale-free surface, cutting maintenance and repainting costs.

Leading structural fabricators have found that they can blast clean all their steel at far less cost than they can wire-brush only on specification. And they get additional savings through greater efficiency when working with thoroughly cleaned steel — steadier production, more lineal feet of welding, faster painting, better inspection, fewer rejects.

The facts in the case for blast cleaning structurals are presented in our new illustrated booklet. Write today for free copy.

WHEELABRATOR
CORPORATION

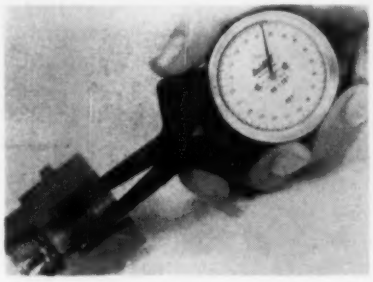
510 South Byrkit Street **Mishawaka, Indiana**
Canadian Offices: Scarborough (Toronto) – Montreal
World's largest manufacturer of airless blast cleaning equipment and abrasives

especially useful on difficult-to-machine material with their faster cutting cycle and longer runs. An extended female center on the cutter end permits the use of an outboard center on the milling machine overarm, and adds the rigidity required for use of carbide. (Quality Tool Works)

For more data circle No. 86 on postcard, p. 151

Special Groove Gage

A new line is available of precision dial measuring instruments with contacting feeler points especially engineered for determining the diameter of internal grooves in difficult-to-measure situations. Slim

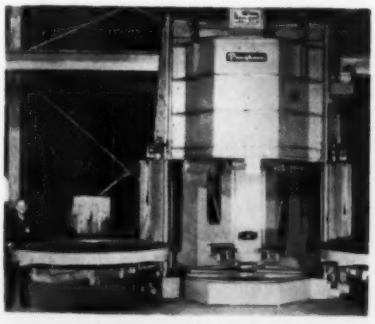


needle-shaped points are used on the legs, one of which is movable. These gages are designed for measuring ID's from 0.400 to 4 in. Each individual model has a range of 0.400 in. (Testing Machines, Inc.)

For more data circle No. 87 on postcard, p. 151

Casting Cleaning Room

An eight-foot-high-capacity twin-table Rotoblast room for cleaning



individual castings weighing up to five tons cuts lost time to a minimum. With the twin-table system, one work table is outside for load-

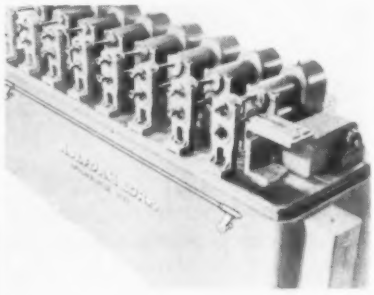
NEW EQUIPMENT

ing or unloading, while the other table load is revolving inside the blast cabinet being cleaned. The room features two Rotoblast wheels with 30-hp motors capable of throwing 100,000 lb of abrasive per hour. Rugged in construction, the machine has a hydraulic unit as optional equipment to move tables into and out of the cabinet. (Pangborn Corp.)

For more data circle No. 88 on postcard, p. 151

Roll Forming Machine

A newly introduced roll forming machine is designed to overcome many of the inherent problems of this industry. The heads have complete and independent adjustments on both lower and upper spindles, making the machine especially



adaptable for deep drawn shapes, or tubes. Vertical camber on any pass is easily controlled, and the machine can induce camber on the final pass to allow rolling of hoops, etc. (Rolform Corp.)

For more data circle No. 89 on postcard, p. 151

R-F Induction Heaters

A 150-kw unit has been added to a line of radio-frequency induction heaters. It features 0-to-100-pct stepless control of power output. Operating frequency is about 450 kc. It can be used in connection with a strip chart recorder, curve follower, and magnetic amplifiers for automatic heat cycling and temperature control. This unit is expected to find particular application in treating of high-strength, heat- and oxidation-resistant metals. (Allis-Chalmers Mfg. Co.)

For more data circle No. 90 on postcard, p. 151

DIES TO WORK MICA AS PRECISELY AS THIS

require the critical inspection that only the Kodak Contour Projector provides.

SPECIAL HIGH-PRECISION DIES are needed to stamp out an intricate mica blank like this, used for positioning electronic tube elements.

Tolerances are on the order of ±0.0002″. In making such dies the firm of Schneider and Marquard, Inc. (specialists in punches and dies for precision mica products) was not satisfied with the accuracy limitations of ordinary inspection methods, and turned to *optical* inspection.

Even then, they found that only one instrument could provide the extremely precise degree of inspection needed, with unparalleled accuracy on all parts of the screen image. That instrument was the Model 30 Kodak Contour Projector.

Accuracy, plus . . . With this large-screen (30-inch) comparator you get a projected image that's as *free* from distortion as the science of optics will permit—accuracy on *every* inch of the viewing screen, including the very edges.

You get a sharp, high-contrast image that's erect and unreversed at all magnifications. Changes in magnification can be made at the flick of a switch.

More refinements . . . You also get efficient head-on surface illumination and a full 16″ throat clearance between collimator lens and front mirror. This clearance is constant at *all* magnifications, permits staging of large parts without repositioning. The many other advanced refinements, extreme optical stability, and rugged construction of the Model 30 Kodak Contour Projector make it a leading choice for large-screen precision micrometry or routine gaging.

Cut inspection costs . . . Along with accuracy, optical gaging with Kodak Contour Projectors offers you savings in tool costs, increased inspection rates, and the economies that result from a minimum of operator training.

You can use optical gaging almost anywhere in your plant . . . receiving, assembly, production, inspection, or toolroom. There are 6 Kodak Contour Projectors to choose from, one matched to your inspection needs.

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The Iron Age Summary

Most Steel Users Set for Strike

For some, steel stocks are not as robust as they would have liked.

But most buyers will have fairly heavy inventories to weather a possible strike.

▪ Most steel users' inventories will be in pretty good shape on June 30, the steel labor contract deadline. A few are seriously worried and are making frantic efforts to take in as much steel as possible as a hedge against a possible strike.

There's little doubt that more steel is being shipped by the mills than is being used, despite the improved tempo of the economy. Steel use is estimated at about 7 million tons a month. This is a little more than had been predicted, but it also is more than 1.5 million tons less than steel shipments.

Inventory Buildup Lags—Shipments for May, when the official figures are announced, are expected to about equal April's all-time high of 8.6 million tons. June shipments will likely drop to about 8.1 million tons.

The inventory buildup will be about 1 million tons less than expected for the first half. Instead of a 9-million-ton accumulation, it will probably be a little less than 8 million tons. The July 1 level will be slightly under 20 million tons.

Outlook Shifting—The new estimate places steel stocks within the normal range. Earlier it was expected stocks would be above normal and that liquidation would begin in July if there was no strike. The shift in outlook, plus strong third quarter bookings and the prospect of large carryovers from June has completely changed prospects for the summer months.

Conservative estimates now place the third quarter operating rate at 70 pct. One analyst sees ingot output falling off in July but shipments remaining heavy—assuming there's no strike. In the rest of the quarter, ingot production would gradually rise. More bullish forecasts range all the way up to above 90 pct for July and the rest of the third quarter.

Mills on Spot—As usual, and often through no fault of their own, the mills are on the spot with some of their customers. By and large, most mills have done a good job on delivery promises. But some users who were promised June delivery won't get it. And they're letting the mills know they resent it.

Companies who either did not or could not put their orders in early are in a pinch. One major Cleveland fabricator put it this way:

"We'll be lucky to get in 75 pct of the steel we have had promised by June. As a fabricator we couldn't place orders early because we had to wait until contracts were bid."

Critical Products—Sheets, plate, bars, and wide flange beams are the most critical products.

Steel Output, Operating Rates

	This Week	Last Week	Month Ago	Year Ago
Production (Net tons, 000 omitted)	2,689	2,661	2,632	1,728
Ingot Index (1947-1949=100)	167.4	165.7	163.8	107.6
Operating Rates				
Chicago	94.0	94.0	93.0	71.0
Pittsburgh	97.5	96.0	96.5	58.5
Philadelphia	98.5	96.0	94.0	66.0
Valley	89.0	90.0*	85.0	49.0
West	95.0	94.5*	93.0	80.0
Cleveland	94.0	94.0*	97.0	44.0
Detroit	97.0	96.0*	101.0	62.0
Buffalo	107.0	107.0	107.0	54.0
South Ohio River	95.0	92.0	92.0	59.0
South	97.0	97.0	93.0	78.0
Upper Ohio River	92.5	91.0*	93.5	89.0
St. Louis	93.0	91.0*	99.0	35.5
Aggregate	95.0	94.0	93.0	64.0

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$37.50	$37.17	$33.83	$35.50
No. 2 bundles	$25.17	$25.17	$22.83	$26.50
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.10
Copper, electrolytic	31.50	31.50	31.50	25.00
Lead, St. Louis	11.80	11.80	11.80	10.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	104.00	104.00	102.75	95.125
Zinc, E. St. Louis	11.00	11.00	11.00	10.00

How to Make Buying Efficient

Reviewing purchasing theory can help improve the buying operation, says Richard Berry, deputy purchasing agent for the City of Chicago.

Many practicing P.A.'s find added night school training valuable, he points out.

■ The purchaser's job is getting bigger. But the P.A. is growing with the job, according to Richard Berry, deputy purchasing agent for the City of Chicago.

This job makes him assistant chief of the nation's second largest metropolitan buying budget (which marketed $161,000 in metallic scrap last year, and cut its purchases to $1,402,000 from a budget of $1,475,000).

He also teaches purchasing at Illinois Institute of Technology; and is assistant editor of Chicago Purchaser, magazine of the Chicago chapter of NAPA.

Qualities Needed — Mr. Berry has this to say about today's purchasing agent:

"The modern P.A. is a many-sided man. We're seeing the advent of the college trained buyer. But every purchasing man is carrying an increasing load of responsibility. In more and more cases, purchasing is moving up to corporate staff level."

In a recent survey of five important metalworking industries, he points out, 55 pct of total costs could be attributed to raw materials purchases. Labor accounted for only 15 pct (average) of total costs, and a wide range of indirect costs for the other 30 pct.

Some Suggestions—His suggestions, as a practicing purchasing agent and a teacher:

Any buyer will do well to go over purchasing theory. Books such as "Procurement, Principles and Cases"; "Purchasing" by Stuart Heinritz, or "Industrial Purchasing" by Westing and Fine, can be obtained at most libraries.

In reviewing these, the practising P.A., whether he's new on the job or a veteran hand, is bound to throw fresh light on his own problems.

Back to School—As a teacher of eight years standing, Mr. Berry reports the number of practicing purchasing agents who attend night school courses is steadily gaining. Most attendees merely want to broaden their general purchasing know-how. But most go back to the shop with new ideas they can use in practical attacks on problem purchases.

Some Benefits—First, the average purchasing agent who examines his own operation may find he should increase the number of his suppliers. His chances for better service, better prices, and new ideas are multipled. Quite often, he's finding a vendor rating system will help him do this.

Second, buyers who go back to school are apt to become keen on codifying their purchase standards. Making up a "vendors' guide" of specifications is an increasingly common practice.

And third, purchasing agents who are out to cut costs want to establish standards for their own departments. They'll tabulate gains and losses from forward buying, number of purchasing errors due to clerical errors or incorrect specifications given a vendor. Inventory storage costs are another measure of purchasing efficiency.

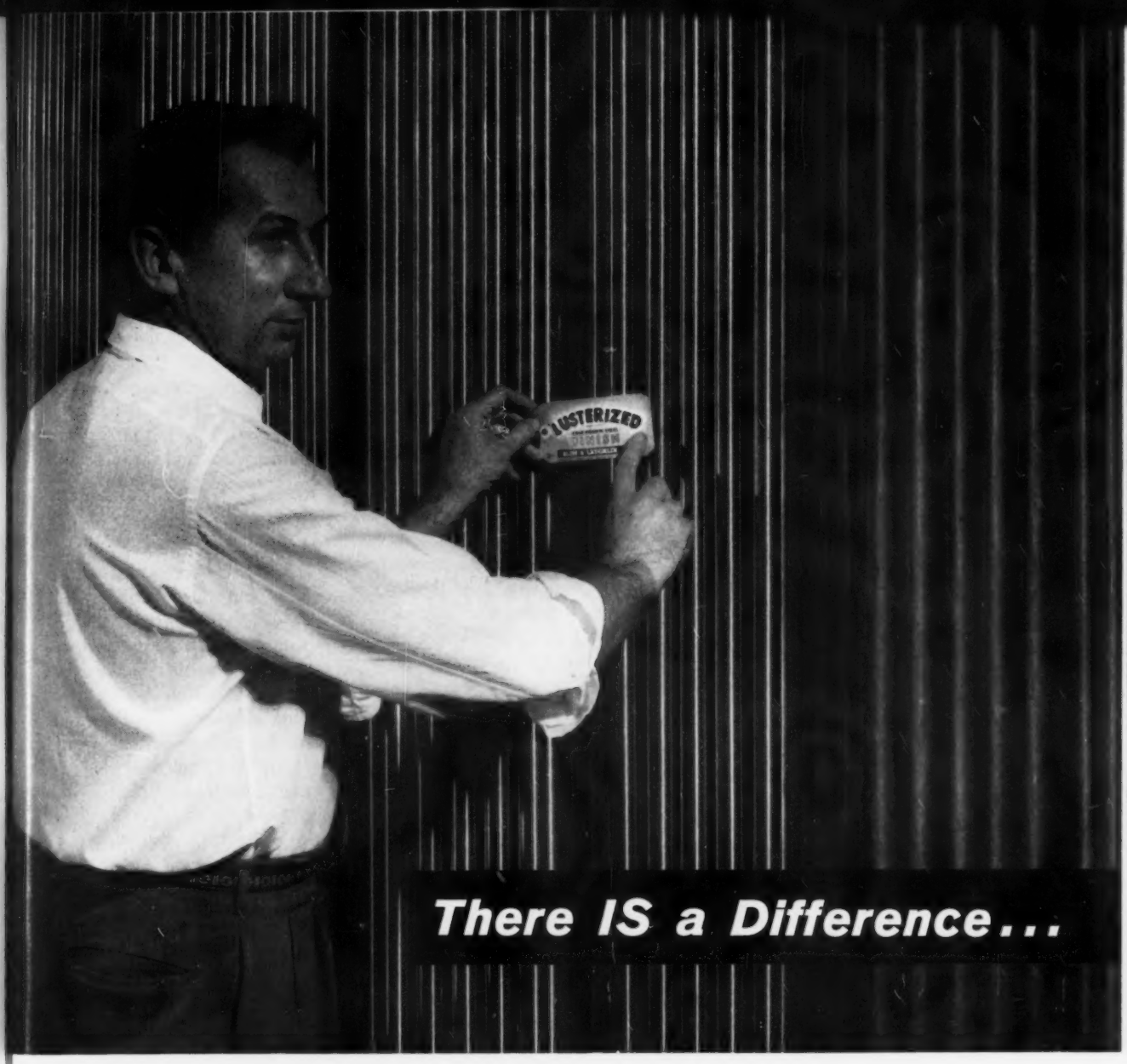
Know Your Company Inside-Out

It's important the buyer know his own company thoroughly, says Richard Berry, deputy purchasing agent for the City of Chicago.

The key to efficient value analysis, he believes, is a purchasing agent's knowledge of his company's product and how it is made.

The P.A. is in an A-1 spot to unearth new processes, new machine tools, and new money saving ideas. Every salesman who reaches his desk is a potential source of savings.

But to apply what he learns from his vendors to his own company, a purchaser must know his own company inside-out.



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Mills Reap Harvest Of Customer Gripes

Customers who won't get second quarter steel as promised are complaining bitterly.

Even the more cautious mills are having trouble. It explains hesitancy over third quarter orders.

▪ Some mills are taking a terrific beating from customers who won't get the second quarter steel they were promised. Even mills that tried hard to keep delivery promises within reason are having trouble.

"This is a difficult period," said one mill in perhaps the understatement of the year. Steel salesmen closer to the firing line were more outspoken:

It's Too Late—"I'm black and blue and my ears are ringing from listening to the blues over the phone. We can't change a thing now anyway. And we can't tell them anything that will make them feel better.

"The rolling schedules have been gone over time and time again to get out the last possible ton. Occasionally we are having a few excesses here and there but they are quickly gobbled up. And they seldom amount to more than a token tonnage."

Behind Caution—So if your mill supplier seems to hesitate when you try to place orders for third quarter delivery, the second quarter lashup explains it.

In some areas it now appears that customers will get no June tonnage of either plates or sheets. Production problems have hit Midwestern plate mills. Lack of shipping facilities is becoming more of a headache as the June 30 deadline nears.

If Strike Is Averted—If there is a steel labor settlement without a strike, the market would certainly lose some of its steam. Just how much is a question. Some mills believe the letdown would be significant. One mill doubts that a labor contract could be signed in time to affect July tonnages. But the reaction would hit August schedules.

Sheet and Strip—Bookings and carryover point to capacity operations in July for makers of hot rolled, cold rolled, galvanized and long terne sheets. The delivery situation varies widely with different mills. Some are reasonably current. Others are as much as 4 weeks delinquent. There is still no sign that late deliveries are hurting customers but the outlook at some sites is for customers to get little or no June tonnage. One mill estimates there may be 5 to 15 pct "water" in third quarter bookings.

Buyers of sheet grades expect that sheet deliveries will begin slowing as early as June 12, as mills begin preparing for a possible strike shutdown. This will not be general, but some mills have already warned customers that delivery problems would increase from that day on into July.

Steel service center sheet stocks are getting quite low. Some distributors are down to 30 days.

Plates and Structurals — A late rush of 3rd quarter orders is hitting producers of plates and structurals. Plates and wide flange beams look very strong for July. Standard structurals are strong but not as active as other heavy steels. Producers feel there is some paper in the 3rd quarter demand but also solid needs. If there is no strike, one mill expects July tonnage to stand up but looks for a reaction in August.

Pipe and Tubing — In Chicago, oil country goods buyers report that they can still get third quarter seamless tube, but that the carryover problem is getting worse. Some special casing scheduled for April delivery will not be delivered earlier than June 15, and maybe not then. One tube supplier warned customers here that average delivery would be 60 days late. Mill stocks of casing and tubing are pretty well cleaned out.

In **Pittsburgh,** the only change in the pipe picture is that oil producers have built less inventory than expected.

Bars—"We're shipping a hell of a lot of steel," says one **Pittsburgh** producer of hot-rolled bars, "but not as much as people want." Same source says the bar carryover will be modest—7 to 10 days. July tonnage is coming in well but is not expected to reach capacity levels. Allowing for some cancellations if there is an early labor settlement, an operating level of 70 pct is predicted for July.

In **Chicago,** Hot-rolled bar picture is beginning to bother bar buyers. Some mills are as little as two weeks behind on HR bars, but average figure is 3-4 weeks and some deliveries are as much as six weeks behind. This is already extending cold finished bar deliveries and has cut steel service center inventories below three months stock, in a number of cases.

PURCHASING AGENT'S CHECKLIST

Brass mills ask for protection from low-priced imports. P. 94

Odds shift toward a short walkout by steel labor. P. 95

Higher interest rate will probably remain for months to come. P. 111

COMPARISON OF PRICES

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**: declines appear in *Italics*.

	June 9 1959	June 2 1959	May 12 1959	June 10 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	46.75	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloys blooms, billits, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

(Effective June 9, 1959)

	June 9 1959	June 2 1959	May 12 1959	June 10 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.97
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.47
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.49
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$42.50	$41.50	$36.50	$37.50
No. 1 steel, Phila. area	35.50	35.50	33.50	33.50
No. 1 steel, Chicago	34.50	34.50	31.50	35.50
No. 1 bundles, Detroit	35.50	35.50	31.50	28.50
Low phos., Youngstown	41.50	41.50	38.50	37.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	47.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	47.50
No. 1 mach'y cast, Chicago	57.50	57.50	53.50	47.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$37.50	$37.17	$33.83	$35.50
No. 2 bundles	25.17	25.17	22.83	26.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	$15.38
Foundry coke, prompt	18.50	18.50	18.50	17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.50	31.50	31.50	25.00
Copper, Lake, Conn.	31.50	31.50	31.50	25.00
Tin, Straits, N. Y.	104.00†	104.00	102.75	95.125
Zinc, East St. Louis	11.00	11.00	11.00	10.00
Lead, St. Louis	11.80	11.80	11.80	10.80
Aluminum, virgin ingot	26.80	26.80	26.80	26.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Activity Tapers Off But Prices Hold

New orders are getting scarce as the June 30 steel strike deadline approaches.

But prospects for a strong post-strike market keeps dealer resistance high.

▪ Scrap prices are holding steady in spite of the uncertainty caused by the deadlock in steel labor negotiations.

Movement of steelmaking scrap has slowed down noticeably in the past week as the June 20 cutoff date set by many mills draws near. Most brokers are reluctant to write long-term orders.

But the slowdown hasn't dampened dealer spirits. Apparently their optimism is based on the belief that the scrap market will bounce back stronger than ever once the steel labor contracts are signed.

A lot of prime grade scrap has been drained out of dealer yards in the past month. The slowdown ahead will give dealers a chance to rebuild their inventories.

In addition, July is normally a vacation month for many mills and dealers. A strike during July, if there is one, would not hurt the scrap industry too much for that reason.

For the port districts, the outlook for new export orders is strong. Movement of material in these districts can be expected to continue at a more active pace than in inland areas.

Based on a $1 increase in Pittsburgh, The IRON AGE No. 1 heavy melting Composite Price rose 33¢ to $37.50.

Pittsburgh—The market continues to strengthen although shipping deadlines are limiting new activity. No. 1 openhearth grades are up $1 as brokers have been offered $43 for heavy melting and $44 for No. 1 dealer bundles. Large tonnages of industrial bundles have been sold with prices averaging around $48 and ranging as high as $50. Railroad offerings were snapped up at prices more than $4 over last month. Unprepared railroad grades sold at prices equal to $45 for No. 1 heavy melting. Anticipation of a strong market after a strike has poured strength into the picture.

Chicago—Despite strong mill resistance, the Chicago scrap market continues firm. Broker offers to sell No. 2 heavy melting at $35 were refused. Electric furnace buyers are active at prices $1 higher. Scrap movement out of the area continues strong. Because of the confusion about a possible steel strike, most brokers are reluctant to write long-term orders.

Philadelphia — A district mill bought limited tonnage of No. 1 heavy melting at $36, reaffirming existing price levels. Otherwise, the movement of scrap is slow. Export orders are filled, although new orders may be coming later this month.

New York—A sudden spurt of export buying has boosted prices sharply. Dealers and brokers expect sales to stay high for the next 60 days at least. Domestic orders have strengthened somewhat, although with a firm June 20 cutoff date. Steelmaking grades rose to a top of $29 for No. 1 heavy melting and $24 to $25 for No. 2 heavy melting.

Detroit—Only a few small orders were written last week. The market appears to have settled down with everyone waiting for the end of the month and some indication of what will happen in the steel labor picture.

Cleveland—The few mills taking in scrap have imposed delivery deadlines of July 15-20, with some extension for longer distance shipments. Some preparation is being made for laying down tonnage in dealer yards during July in anticipation of a post-strike rush.

St. Louis—Mills are buying actively. Dealers are moving more scrap than they have been in many weeks, and few seem anxious to hold out for better prices.

Birmingham — Movement of scrap increased this week. Dealers showed willingness to sell at slightly higher prices. An electric furnace mill found ready takers when it raised its buying price $2 a ton.

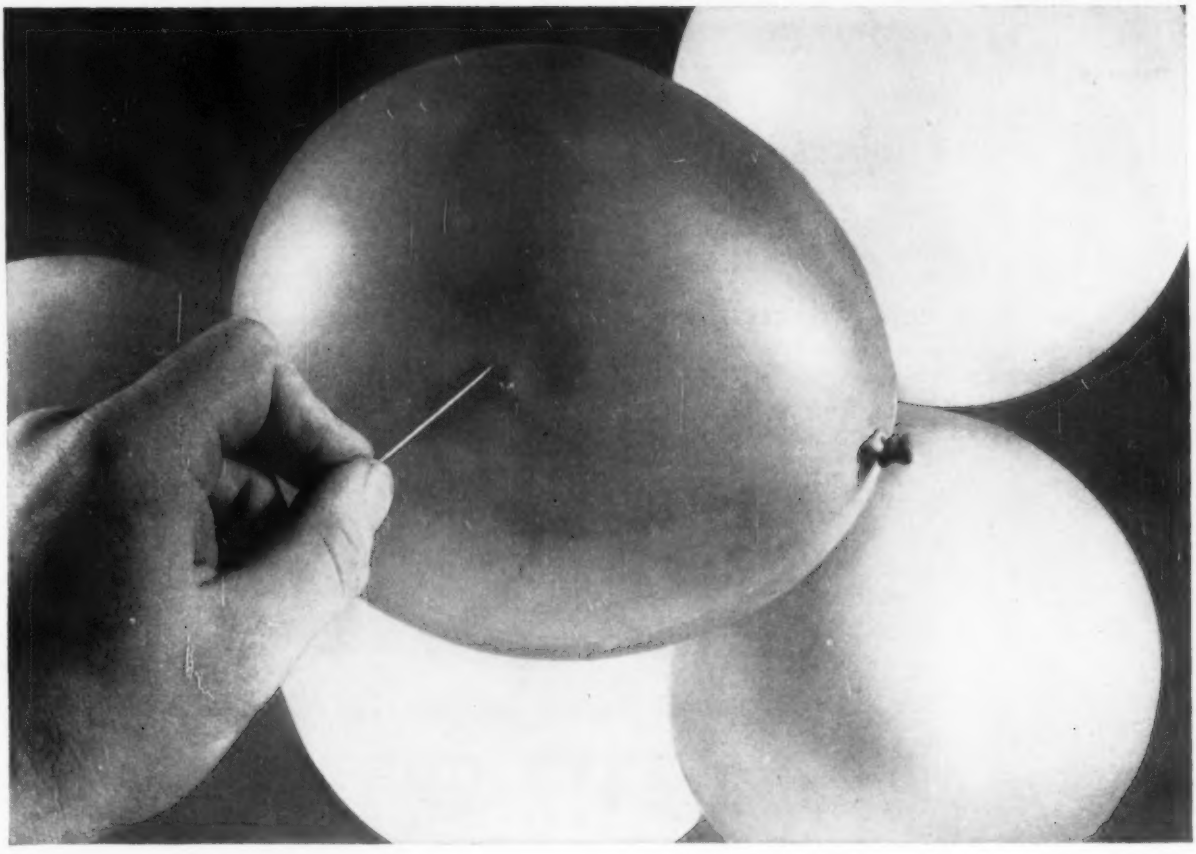
Cincinnati—Mills are not anxious to buy scrap and dealers are not willing to sell at quoted prices. Some industrial tonnage is starting to move upriver. Foundry business is still slow.

Buffalo — The market here is stronger. Prices, however, are unchanged. Dealers are rushing delivery on the last sale which has a June 20 deadline.

Boston — Prices of openhearth scrap and machine shop turnings are up $1. Activity is light but sentiment is optimistic in the trade.

West Coast—Prices are firm. Cupola cast rose $2 in San Francisco. Flow of scrap is slow as brokers have filled their commitments for the month. One major mill will shut down for vacation in July.

Houston—The market continues in the doldrums and it appears this will be the pattern for the rest of the month. A district mill is still receiving shipments on orders placed through June 15. Dealers don't appear to be in a hurry to move scrap.



Machine Tool Buyers:

Beware the fallacy of projecting today's labor rates!

Almost without exception, machine tool replacement formulas employ an erroneous factor in computing savings — they are based on *today's* labor rates.

It seems basically sound to suggest, in the case of a contemplated investment in equipment, that a projection be made as to the estimated period over which the equipment is to be used.

Assuming this to be ten years, it is a fairly simple matter to project the *average* wage rate over the next ten years by using the historical increase for the past several years. This increase is known to be from 5 to 6% per year.

Using 5%, we then have a simple computation to determine the average projected wage rate which should be used in computing savings in a replacement formula.

Assuming a current wage rate of $2.50 per hour, this becomes $4.07 per hour at the end of ten years, or an increase of 62.8% over today's labor rate.

This percentage increase could reasonably be applied also to other factors in the computation of savings, such as indirect labor, fringe benefits, maintenance, etc.

In contemplating the purchase of a piece of equipment which will last for a number of years, it is fallacious, therefore, to compute savings in terms of today's costs only.

Does Jones & Lamson offer a positive approach; a realistic, workable formula that is free from fallacies such as this? *Yes!*

Write today for complete information.

the man who needs
a new machine tool
is already paying for it

JONES & LAMSON Machine Company, 511 Clinton St., Springfield, Vt.

Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

SCRAP PRICES *(Effective June 9, 1969)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$42.00 to $43.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Low phos. punch'gs plate	46.00 to 47.00
Heavy turnings	33.00 to 34.00
No. 1 RR hvy. melting	43.00 to 44.00
Scrap rails, random lgth.	51.00 to 52.00
Rails 2 ft and under	56.00 to 57.00
RR specialties	50.00 to 51.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00
Stainless	
18-8 bundles and solids	230.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	48.00 to 49.00
Low phos. punch'gs plate, ½ in. and heavier	45.00 to 46.00
Low phos. 2 ft and under	43.00 to 44.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	46.00 to 47.00
Rerolling rails	57.00 to 58.00
Rails 2 ft and under	53.00 to 54.00
Angles and splice bars	49.00 to 50.00
RR steel car axles	64.00 to 65.00
RR couplers and knuckles	47.00 to 48.00
No. 1 machinery cast.	57.00 to 58.00
Cupola cast	50.00 to 51.00
Cast iron wheels	42.00 to 43.00
Malleable	58.00 to 59.00
Stove plate	48.00 to 49.00
Steel car wheels	46.00 to 47.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	115.00 to 120.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	19.00 to 20.00
Mixed bor. short turn.	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	24.00 to 25.00
Low phos. 5 ft and under	38.00 to 40.00
Low phos. 2 ft punch'gs	40.00 to 42.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	32.00 to 33.00
RR specialties	42.00 to 43.00
Rails 18 in. and under	59.00 to 60.00
Cupola cast	40.00 to 41.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	44.00 to 45.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	27.50 to 28.50
No. 1 dealer bundles	32.50 to 33.50
No. 2 bundles	21.00 to 22.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	16.00 to 17.00
Low phos. 18 in. and under	41.00 to 42.00
Rails, random length	46.00 to 47.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	49.00 to 50.00

Youngstown

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	38.50 to 39.50
No. 2 bundles	27.50 to 28.50
Machine shop turn.	19.50 to 20.50
Shoveling turnings	24.50 to 25.50
Low phos. plate	41.00 to 42.00

CLEVELAND

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	41.50 to 42.50
No. 2 bundles	24.00 to 25.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Cut structural & plates, 2 ft & under	42.00 to 43.00
Drop forge flashings	35.00 to 36.00
Low phos. punch'gs plate	36.00 to 37.00
Foundry steel, 2 ft & under	37.00 to 38.00
No. 1 RR hvy. melting	39.00 to 40.00
Rails 2 ft and under	55.00 to 56.00
Rails 18 in. and under	56.00 to 57.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	66.00 to 67.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 busheling	33.00 to 34.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. plate	40.00 to 41.00
Structurals and plate, 2 ft and under	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	38.00 to 39.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	50.00 to 51.00
Angles and splice bars	44.00 to 45.00
RR specialties	43.00 to 44.00
Cupola cast	50.00 to 51.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	40.00 to 41.00
Stove plate	45.00 to 46.00
Cast iron car wheels	40.00 to 41.00
Rerolling rails	54.00 to 55.00
Unstripped motor blocks	41.00 to 42.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	30.00 to 31.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	41.00 to 42.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rails, random lgth.	40.00 to 41.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	43.00 to 44.00
Rerolling rails	52.00 to 53.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	40.00 to 41.00
Unstripped motor blocks	40.00 to 41.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 dealer bundles	17.00 to 18.00
Machine shop turnings	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean chem. cast. borings	18.00 to 20.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	19.50 to 20.50
No. 1 busheling	33.00 to 34.00
Drop forge flashings	32.00 to 33.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Heavy breakable cast.	34.00 to 35.00
Mixed cupola cast.	43.00 to 44.00
Automotive cast.	50.00 to 51.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	100.00 to 105.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	14.00 to 15.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	8.00 to 9.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	13.00 to 14.00
No. 1 machinery cast.	33.00 to 34.00
Mixed cupola cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	33.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	47.00

Los Angeles

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	35.00
No. 2 bundles	18.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00
No. 1 cupola cast.	45.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont

Brokers buying prices per gross ton on cars:

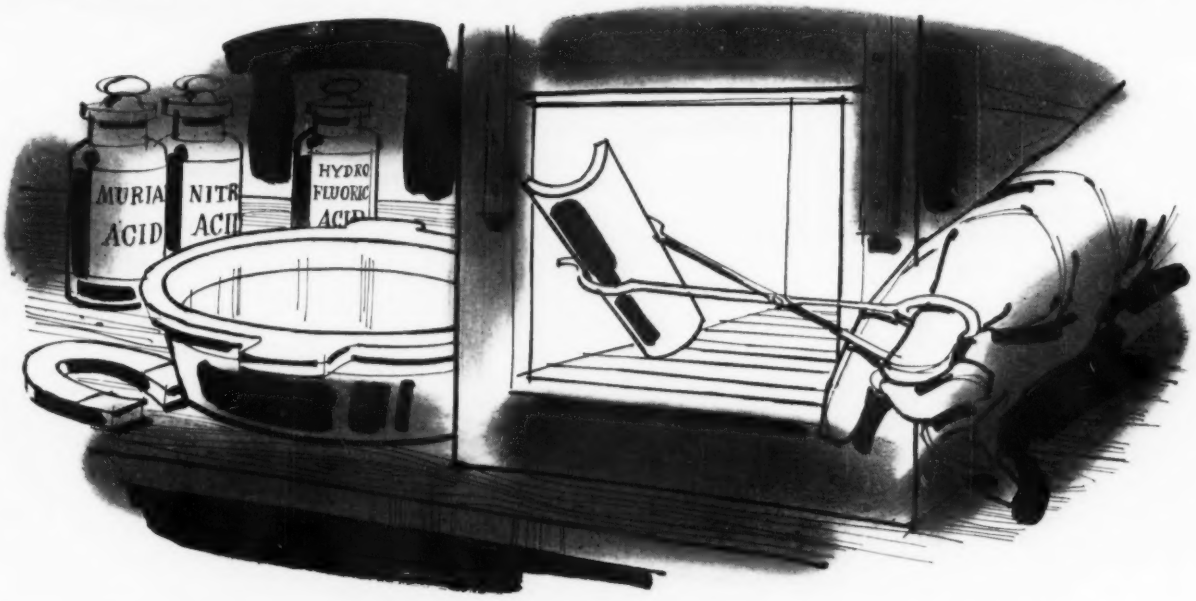
No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$45.00 to 46.00
Unstripped motor blocks	37.00 to 38.00
Cupola cast	44.00 to 45.00
Heavy breakable cast.	28.00 to 29.00

S-E-G-R-E-G-A-T-E-D SCRAP IS WORTH MORE



Here is how to test for

STAINLESS STEEL TYPES 321 and 347

These two stainless steel types are recommended for parts which are fabricated by welding and cannot be subsequently heat treated. They are also used for parts which are subject to severe corrosive conditions or in situations where they may undergo a temperature range of 800 to 1650 deg. F.

Type 321 is a basic 18-8 analysis containing titanium and is used in aircraft and missile parts.

Type 347 is a basic 18-8 analysis which contains columbium and tantalum. This type is important for use in welded storage tanks containing organic chemicals, jet engine parts and heat resistors. It also finds an important place in the petroleum industry where it is used in distilling and fractionating columns.

For scrap of known analysis, our personnel, equipment and strategically located facilities are specifically geared for the purchase or sale of dependably segregated metals. We welcome your inquiry.

PROCEDURE

Rub specimen with emery paper to obtain clean surface. Add 1 drop of 1:1 nitric acid. If there is no attack, the material is Stainless Steel. Test sample with magnet. If it is definitely non-magnetic, the specimen is one of the 18-8 steels. Place specimen in a solution of muriatic acid (1 part water, 1 part muriatic acid) at a temperature of 180/190 deg. F. After 5 minutes, Types 302, 304, 305, 316, 317, 321 and 347 will be white. Then, place specimen in fresh solution of muriatic acid at temperature of 180/190 deg. F. Within 2 minutes there will be active attack and gas evolution on Types 302, 304, 321 and 347. To separate 321 and 347 from 302 and 304, a stabilization test is necessary. Heat specimens to 1250 deg. F. for 2 hours and then cool to room temperature in air. Then place specimens in cold solution of 3 parts nitric acid, 1 part hydrofluoric acid, and 6 parts water. Leave for 1 hour. Remove specimens from solution and wash with water. Stainless Types 321 and 347 will show very slight attack on their surface.

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Copper Watches Steel Talks

Copper management thinks it knows just about what its unions will accept.

But companies won't commit themselves until they get the drift of steel-labor talks.

▪ Copper people insist there is no real parallel between steel labor and copper labor. Their reasoning stresses the difference in production and marketing techniques between the two industries.

Nevertheless, it is becoming more apparent that until steel settles, or, more likely, until it becomes clear which way the tide is flowing, the only thing to come out of talks between the major copper companies and their unions will be progress reports.

Copper management right now thinks it has a fair idea of what the unions will be satisfied with. But they want to see how well the steel companies do before committing themselves.

Observers say there is "slightly better than an outside chance" copper can squeak through the year without a major strike.

Copper Companies' Strong Points —First, copper management tends to be more sophisticated in its industrial relations. It is rare when the industry, or even a company, can get through the year without a strike. There are just too many independent, separately-negotiating unions, any one of which could paralyze an installation.

Second, while copper managements have been decrying inflation (". . . our most insidious enemy," says Anaconda's chairman Clyde Weed) there has been no serious talk of any wage freeze.

Observers pretty well agree that while most talks have started, it is just too early to get any drifts. The major union involved. Mine, Mill and Smelter Workers in most cases submitted an unusually long list of demands, most of which will fall by the wayside gradually.

Best bet now: Most of the new contracts will be for one, or maybe two years. Three year pacts are out. Most copper companies will offer more money, but very little. How much any settlement costs a company will be differently interpreted by union and management. If steelworkers appear to be destined for any increases, the settlement in the copper industry is likely to be around 8¢ to 10¢, interpreted by the companies. If steel companies hold firm, copper settlements will range from 5¢ to 8¢ per hour.

The main issue will probably be productivity.

Productivity — A publication of the International Mine, Mill and Smelter Workers says, "Since 1956, when present Mine, Mill contracts in copper were signed, mine output of recoverable copper has gone up by almost 20 pct."

Clyde Weed, Anaconda Chairman has insisted, "Our wages paid in Montana (company's leading U. S. source) have increased about 400 pct since 1940, while the price of copper has increased only about 200 pct."

Another highly regarded observer says management and the unions will thoroughly air their theories of productivity through most of their sessions, but that when the whole thing is over neither will have converted the other even slightly. The problem: No one seems to agree on what productivity is, what causes it, and how its fruits should be divided.

Imports

Harry Gumpert, vice president of Brandeis, Goldschmidt & Co., metal traders, spent two months in Japan talking to government officials and leading metal fabricators. He has both good and bad news for U. S. nonferrous fabricators.

The Japanese are going to take an even bigger slice of the U. S. metal market. Their fabricating industry is growing rapidly. And their government is striving for more exports to dollar areas.

A bright spot: Japanese exporters will keep their penetration of the U. S. market below what they consider the boiling point. They will voluntarily limit sales to the U. S. to prevent restrictive legislation.

Tin prices for the week: June 3—104.00; June 4—104.00; June 5—104.00; June 8—104.00; June 9—104.00.*

*Estimate.

Primary Prices

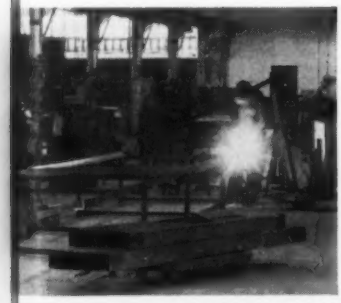
(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	6/1/59
Aluminum ingot	26.80	26.10	6/1/59
Copper (E)	31.50	30.00	3/9/59
Copper (CS)	32.00	32.50	4/30/59
Copper (L)	31.50	30.00	3/9/59
Lead, St. L.	11.80	11.30	5/7/59
Lead, N. Y.	12.00	11.50	5/7/59
Magnesium ingot	36.00	34.50	6/13/58
Magnesium pig	35.25	33.75	6/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	182-182	185-205	11/3/58
Zinc, E. St. L.	11.00	11.50	2/25/59
Zinc, N. Y.	11.50	12.00	2/25/59

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 186.

LIGHTEN your inventories . . . BRIGHTEN your profits . . . WIDEN your markets . . . A Steel Service Center can help you achieve all three, so why not take a long, hard look at your steel buying policies. Maybe you can reduce inventories, increase profits and open up new markets by purchasing more steel as you need it, ready for production, from modern Steel Service Centers.

"We're saving $420,000 in inventory space!"

says Mr. Marvin H. Coleman, President, Conveyor Systems, Inc., Morton Grove, Ill.



This is hard-working production area. A small inventory keeps it that way.

Mr. John Drangine checking inventory. It's small, yet ample. Never overstocked!

"Today, we utilize only 6,000 square feet of space for our immediate steel needs," says Mr. Coleman. "But, if we were forced to stock all of our material requirements it would take at least 50,000 square feet of in-plant area.

"This would mean setting aside an additional 42,000 square feet. And, at the rate of $10.00 per square foot, it sums up to a dead space investment of $420,000, depreciated not in five or ten years, but over a twenty-year period. However, we've eliminated this problem by dealing with U.S. Steel Supply and getting prompt, efficient delivery of the steel we need . . . when we need it.

Why not take a close look at your steel buying policies—you'll find U.S. Steel Supply's pamphlet entitled "Value Analysis at Work" very helpful. Write to our Chicago Office, or call your nearest U.S. Steel Supply Steel Service Center. You'll find us in the Yellow Pages listed under *Steel*.

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General Offices: 208 South LaSalle Street, Chicago 4, Ill.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136 - .249	.250-3.
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	55.63	.....	52.86	55.82
Brass, Yellow	48.24	48.75	48.18	51.05
Brass, Low	51.23	51.77	51.17	54.54
Brass, R L	52.29	52.83	52.23	55.60
Brass, Naval	52.80	.....	46.61	56.21
Muntz Metal	50.85	.....	46.16	.....
Comm. Bz.	53.90	54.44	53.84	56.96
Mang. Bz.	56.54	.....	50.14	.....
Phos. Bz. 5%	75.34	.....	75.84	.....

Free Cutting Brass Rod 32.73

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $7.25-$8.50; alloy, $13.40-$17.00, Plate, HR, commercially pure, $5.25-$6.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.75-$6.25; alloy, $7.75-$10.00; Bar, HR or forged, commercially pure, $4.25-$5.00; alloy, $4.25-$7.50; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb) .... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 35.00 to 42.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $243 to $246
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz... $18 to $20
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.25
- No. 120 ..... 29.00
- No. 123 ..... 28.00

80-10-10 ingot
- No. 305 ..... 34.50
- No. 315 ..... 32.50

88-10-2 ingot
- No. 210 ..... 43.50
- No. 215 ..... 39.25
- No. 245 ..... 35.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 27.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.75-25.00
- 0.60 copper max. 24.50-24.75

Piston alloys (No. 122 type)..24.25-25.25
No. 12 alum. (No. 2 grade)...21.50-22.00
108 alloy 22.00-22.50
195 alloy 25.00-26.00
13 alloy (0.60 copper max.)...24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.50-23.50
Grade 2—92-95% 21.25-22.25
Grade 3—90-92% 20.25-21.25
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27½	26¾
Yellow brass	20⅝	18¾
Red brass	24⅛	23½
Comm. bronze	25⅛	24⅜
Mang. bronze	19⅛	18⅜
Free cutting rod ends.	20½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 26
Light copper 24
*Refinery brass 25½
Copper bearing material 24¾
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 26
Light copper 24
No. 1 composition 22
No. 1 comp. turnings 21½
Hvy. yellow brass solids 16
Brass pipe 16½
Radiators 17

Aluminum

Mixed old cast. ..... 13½—14½
Mixed new clips ..... 16 —17
Mixed turnings, dry ..... 14 —15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 25 —25½
No. 2 copper wire ..... 23 —23½
Light copper ..... 21 —21½
Auto radiators (unsweated). 14½—15
No. 1 composition ..... 19 —19½
No. 1 composition turnings .. 17½—18
Cocks and faucets ..... 15 —15½
Clean heavy yellow brass ... 13½—13¾
Brass pipe ..... 15 —15½
New soft brass clippings .... 15¾—16¼
No. 1 brass rod turnings .... 13 —13½

Aluminum

Alum. pistons and struts .... 6 — 6½
Aluminum crankcase ..... 9½—10
1100 (2s) aluminum clippings 13 —13½
Old sheet and utensils ..... 9½—10
Borings and turnings ..... 6 — 6½
Industrial castings ..... 9½—10
2020 (24S) clippings ..... 11 —11½

Zinc

New zinc clippings ..... 4¾— 5¼
Old zinc ..... 3¼— 3½
Zinc routings ..... 2 — 2¼
Old die cast scrap ..... 1¾— 2

Nickel and Monel

Pure nickel clippings 52-54
Clean nickel turnings 37-40
Nickel anodes 52-54
Nickel rod ends 52-54
New Monel clippings 30-32
Clean Monel turnings 30-32
Old sheet Monel 26-28
Nickel silver clippings, mixed 18
Nickel silver turnings, mixed 15

Lead

Soft scrap lead ..... 7 — 7¼
Battery plates (dry) ..... 2 — 2¼
Batteries, acid free ..... 1⅞— 2⅛

Miscellanous

Block tin ..... 77 —78
No. 1 pewter ..... 59 —60
Auto babbitt ..... 40 —41
Mixer common babbitt ..... 9½—10
Solder joints ..... 13¼—13¾
Siphon tops 42
Small foundry type ..... 9½—10
Monotype ..... 9½—10
Lino. and stereotype ..... 8½— 9
Electrotype ..... 7 — 7½
Hand picked type shells .... 5¼— 5¾
Lino. and stereo. dross ..... 2½— 2¾
Electro dross ..... 2¼— 2¾

(Effective June 8, 1959)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *F3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective June 8, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Hollowware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*°, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *W5, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective June 8, 1959)

°7.425 at Sharon-Niles is 7.225

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.20 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective June 8, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B.. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co. Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective June 8, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium.. .955 D-3, D-5
Oil hardened manganese .505 O-2
Special carbon ..... .38 W-1
Extra carbon ..... .38 W-1
Regular carbon ..... .325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 43.15; 1 side, 36.20.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *U1*	5.75	.....	.....	.....	6.875	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *U1*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P3*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Y1*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S7*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective June 8, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dsv. *M4****	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	17-	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	...	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Y1**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	12¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine ½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 1⅛" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41

Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished	
⅞ in. and smaller	65

Rivets	*Base per 100 lb*
½ in. and larger	$12.85
	Pct. Off List
7/16 in. and smaller	15

Cap Screws *Discount (Packages)*

Full Finished H. C. Heat Treat

New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54
¾", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
¾", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	60	60
Bulk		
Quantity		
To ¼" diam. incl. — 25,000-and over	60	..
5/16 to ½" diam. incl. — 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller — 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	46.00
Electrodeposited	38.00
Brass, 80-20, ball anodes, 2000 lb or more	51.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	18.00
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.20
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*	.....	.....	.....	.....
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99	.....	.....	.....	.....	.....
Boston**	.10	10.22[1]	11.27[2]	12.07[3]	12.17[4]	10.42[5]	10.72[6]	10.34[7]	13.45*	16.79	15.79	20.29	19.54
Buffalo	.15	8.55	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	.15	8.40	9.60	11.05	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.66	11.10	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland**	.15	8.32[1]	9.61[2]	11.15[3]	10.36[4]	8.76[5]	9.63[6]	9.36[7]	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit	.15	8.66	9.86	11.40	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60	.....	8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70[8]	11.20-11.80	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.54	9.74	11.19	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	9.27	10.59	11.40	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.30	9.35	10.71	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.32[1]	9.61[2]	10.95[3]	10.36[4]	8.52[5]	9.24[6]	8.62[7]	11.40*	16.20	15.20	19.70	18.95
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20[9]	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		10.30	11.55	12.50	10.25	10.10	10.20	10.50	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.45	11.70	10.90	10.65	10.25	10.35	11.15	14.85	17.75	16.95	21.55	20.75
St. Louis	.15	8.78	9.98	11.43	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	11.64	8.99	9.45	9.53	9.70	10.16	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** Prices based on 2000 lb item quantities except for galv. sheet, c-f and alloy bars.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36 x 96 —120; [2] 20 ga. x 36 x 96 —120; [3] 10 ga. x 36 —120; [4] ¼" x 1"; [5] ¼" x 84"; [6] I-Beams 6 x 12.5; [7] Rounds—⅝-2 15/16"; [8] 15 ga. & heavier; [9] 14 ga. & lighter.

(Effective June 8, 1959)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1,* (25¢ per lb. higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa , *C2.*

(Effective June 8, 1959)

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C....	41.00	0.50% C....	38.00
0.05% C....	39.00	1.00% C....	37.75
0.10% C....	38.50	1.50% C....	37.50
0.20% C....	38.25	2.00% C....	37.25

4.00-4.50% C, 60-70% Cr, 1-2% Si.. 28.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 28.25
0.025% C (Simplex) 36.75
8% max C, 50-55% Cr, 6% max Si. 25.75
4½% max C, 50-55% Cr, 2% max Si 26.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97.25% min. Cr, 1% max. Fe.
0.10% max. C $1.29
9 to 11% C, 88-91% Cr, 0.75% Fe... 1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.
Carloads $1.15
Ton lots 1.17
Less ton lots 1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed.
Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	28.25	14.60
Ton lots	33.50	16.05
Less ton lots	35.10	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.
Carloads, bulk 24.00
Ton lots 27.95
Less ton lots 29.45

Calcium-Manganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.
Carloads, bulk 23.00
Ton lots 26.15
Less ton lots 27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.
Ton lots 21.15
Less ton lots 22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.
Carload lots 18.45
Ton lots 19.95
Less ton lots 21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.
Carload packed 19.20
Ton lots to carload packed 21.15
Less ton lots 22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.25
Johnstown, Pa.	12.25
Neville Island, Pa.	12.25
Sheridan, Pa.	12.25
Philo, Ohio	12.25
S. Duquesne	12.25

Add or substract 0.1¢ for each 1 pct Mn above or below base content.
Briquets, delivered, 66 pct Mn:
Carloads, bulk 14.80
Ton lots packed in bags 17.20

Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$109.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

2 in. x down, cents per pound of metal delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed 45.75
Ton lots 47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.
Carloads 34.00
Ton lots 36.00
250 to 1999 lb 38.00
Premium for Hydrogen - removed metal 0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 25.50

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	(Bulk) 37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si ...	28.60	31.40	32.60

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.
Carloads bulk 12.80
Ton lots, packed 14.45
Carloads, bulk, delivered, per lb of briquet 15.10
Briquets, packed pallets, 3000 lb up to carloads 16.30

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe..	24.95	23.65
98% Si, 1.0% Fe	24.45	23.15

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.
Carloads, bulk 8.00
Ton lots, packed 10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si....	14.60	75% Si....	16.90
65% Si....	15.75	85% Si....	18.60
	90% Si....	20.00	

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.
Openhearth 3.20
Crucible 3.30
High speed steel 3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb..	2.40	3.30	4.55

(Effective June 8, 1959)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk ..... 9.85¢
Ton lots ..... 11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.50

Ferrocolumbium, 50-60% lb, 2 in. x D, delivered per pound contained Cb.

Ton lots $3.90
Less ton lots..... 3.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.76

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down packed, per pounds contained W, ton lots delivered ..... $2.15 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.49

bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.38

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump ..... 18.50¢
Ton lots, packed lump ..... 20.50¢
Less ton lots ..... 21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 .... $1.38

Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk.. 26.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Bortram, f.o.b. Niagara Falls.
Ton lots per pound ..... 45¢
Less ton lots, per pound ..... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots (packed) $1.48
Less ton lots (packed) 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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Charles G. Cooper, *Vice President,*
The Cooper-Bessemer Corporation, explains...

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If you need heavy-duty engines or compressors, Cooper-Bessemer can serve you promptly with the world's most advanced designs . . . whether you are located in Europe, Asia, South America or any other area of the globe. We have developed an outstanding organization of representatives, subsidiaries and licensees to provide experienced, full-scope service throughout the world. These companies can supply your needs in Cooper-Bessemer products backed by experienced, highly efficient engineering and technical service.

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ENGINE OR MOTOR DRIVEN

How Used Machines Aid Expansion

By buying used equipment small plants can expand despite tight money and rising costs.

That's the opinion of Elmer W. Pfeil, former president of the Machinery Dealers National Association.

▪ Continual tightening of the money supply is making a good used machine tool look better and better for many a small business, observers feel.

Elmer W. Pfeil, president of his own used machinery firm in Cleveland and former national association president sums it up this way:

"Money is continually getting tighter. Interest rates on government and other bonds has risen steadily. The steel labor negotiations will have a bearing on plant operating costs. We find this all adding up to the point where it is restricting the expansion of small plants."

Expand Economically — "With this money tightness, our used machine tools can fill the gap in expansion at a fraction of the cost of a new tool and with almost immediate delivery. Many forward-thinking plant managers are giving the used machinery market a second look and finding they can expand their operation and still stay within the budget."

Sales Trend—On a nation-wide basis used machinery sales fell off a little in March and April after making substantial gains in February. But the level of business is still well above 1958 sales.

Here's the association's sales index so far this year: January—109.5; February—148.1; March—139.3; and April—132.9. The April index is substantially above the April, 1958 index of 105.

During April this year dollar sales dropped 4.6 pct below those of the preceding month. But they were 26.6 pct above dollar sales for April '58.

Cleveland Upsurge — In the Cleveland area, the used machine market has picked up in line with the national trend. Biggest demand is for heavy equipment items like large presses, press brakes, shears and heavier turret lathes.

Demand has been across the board. Most seems to stem from upgrading of existing shops. Older equipment is being replaced with more modern, precise, and faster used units. In many cases the lesser investment in used machinery compared to new is the single major factor that makes the shop improvement programs possible.

Seaway's Impact—Used machinery dealers in the Cleveland area are giving little thought to the St. Lawrence Seaway as an important factor in their business. There is practically no demand in the U. S. for used foreign-made tools.

Some American Lend-Lease equipment sent to Europe is starting to come back as used units but the number is a drop in the bucket. Used machinery being sent to Europe could be shipped all-water from Cleveland for less than rail-water combinations.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDING ROLLS
10' x 10 Ga. Bertsch No. 6 Initial Type
20' x 3/8" Niles Pyramid Type
32' x 3/8" BALDWIN PYRAMID TYPE—Late

BORING MILL—VERTICAL
62" King Heavy Duty Two Rail Heads, One Side head, 4 Chuck Jaws, 30 H.P. Main Drive Motor

BRAKE—BOX & PAN
8' x 1/4" Dreis & Krump, 12" Finger Extension

BRAKE—PRESS TYPE
90 ton Niagara, Model 90-8-10

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	40' Span	220 Volt D.C.
5 ton P&H	57' Span	220/3/60 A.C.
8 ton P&H	55' Span	230/3/60
10 ton P&H	39' Span	230 Volt D.C.
10 ton Milwaukee	57' Span	230 Volt D.C.
10 ton Shaw	48' Span	230 Volt D.C.
10 ton Whiting	75' Span	220/3/60 A.C.
10 ton Shaw	120' Span	230 Volt D.C.
30 ton Shaw	70' Span	230 Volt D.C.
120 ton Niles	67' Span	230 Volt D.C.
120 ton Shepard Niles	77' Span	220/3/60 A.C.

DRAW BENCHES
7,000 lb. Draw Bench, 51 ft. Draw
10,000 lb. Draw Bench, 50 ft. Draw
35,000 lb. Draw Bench, 41 ft. Draw

FORGING MACHINES
1" to 5" Acme, Ajax, National

HAMMERS—BOARD DROP—STEAM DROP—STEAM FORGING 800 lb. to 12,000 lb. incl.

HEADERS
#250C Manville Single Stroke Solid Die
#14 Waterbury Farrel Dble Str Open Die

LATHES
Model 22GM Monarch Geared Head, 24½" Swing 48" between Centers
24" x 25' Monarch Engine Lathe

LEVELERS—ROLLERS
24" Torrington, 9 Rolls 8" Dia.
66" Guide 17 Rolls 4¼" Dia.
72 Leveler 17 Rolls 2⅝" Backed Up

NIBBLER
Pullmax Model 2, Capacity 11/32"

PRESSES—HYDRAULIC
300 ton Southwark Platen 28" x 28", Stroke 25"
500 ton Watson Stillman Piercing Press, 48" x 72"
600 ton Birdsboro, Platen 48 x 48", Stroke 15"
1000 ton Southwark Bed 44" x 54", Stroke 20"
4500 ton B-L-H Bed 68 x 68", Stroke 40"

PRESS—KNUCKLE JOINT
800 ton Cleveland Model 8-K, 6" Stroke

PUNCH & SHEAR COMBINATIONS
#2½ Buffalo Ironworker
#8 Kling, 36" Throat Capacity 1⅜" x 1"
Rock River Double End. 28" Throat Capy. 1¼" x 1"

RIVETERS
150 ton Southwark Hydr., 125" Throat
275 ton R. D. Wood Hydr., 18'6" Throat

ROLLING MILLS
3½" x 7" Six Roll Cluster Mill
10" x 14" Single Stand Two High
13" x 16" Single Stand Two High
16" x 24" Two Stand Two High
20" x 36" Single Stand Two High
26" x 60" Single Stand Two High
12" x 32" Birdsboro 3-Hi Bar Mill
22" x 40" Lewis 3-Hi Sheet Mill
21" x 52" x 77" Three Stand 4-High

ROLLS—FORMING
M2½ Yoder 6 Stand, Max Width 15"
18 Stand Custom Built, 2½ Shaft, with take 36" wide

ROLLS—PLATE STRAIGHTENING
72" McKay 9 Rolls 15" Dia. Backed-up
92" Hilles & Jones, 6 Rolls 10" Dia.

SAW
Model 122-BA Ty-Sa-Man., Capacity 8 Cuts 2" Deep at one time 15" wide, 16 ft. long

SCALPING OR BILLET PEELING MACHINE
Medart #6 Size HFBP, Capacity 3½" to 5" incl.

SHEAR—GATE
10' x 1" Cincinnati Model 10010

SHEARS, MISC.
36" Hallden Drum Type, Capy. 33-38 Ga.
60" x 10 Ga. Cut-off Line

SHEAR—ROTARY
No. 23A Quickwork Whiting 3/16" Capacity

SHEARS—SQUARING
6' x 14 Ga. Edwards, Motor Drive—LATE
10' x 10 Ga. Wysong & Miles
12' x 3/16" Cincinnati #1412

SLITTERS
24" Torrington Slitting Line, 3½" Arbor
36" Waterbury Farrel Slitting Line, 4½" Arbor
84" Slitting Line, Arbor Dia. 7"

STRAIGHTENER
Torrington #1734 12-Roll, Capy. 1¾", Rd. 1-9/16"

TESTING MACHINES
20,000 lb. Baldwin Univ. Hydraulic
50,000 lb. Olsen 3-Screw Beam Type Universal
60,000 lb. Southwark-Emery Universal Hydraulic
500,000 lb. Olsen, Super DeLuxe Compression

WELDING POSITIONER
16,000# Ransome Model 160P

WIRE DRAWING MACHINES
Type B Morgan 4-Block Capy. #5' Rod down
Scudder 3-Block 20 Dia.
Superior 7-Draft Cone Type Capy. 14 Ga. down

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Electric Power Equipment — A. C. Motors

3 phase—60 cycle

SLIP RING

Qu.	H.P.	Make	Type	Volts	Speed
1	1750	G.E.	M-579BS	4800	1800
1	1500	G.E.	MT	6600	1187
1	800	Whse.	CW	550	1776
1	700	A.C.		2300	500
1	600	Whse.	CW-4-32D-15	440	1778
1	500	G.E.	MT-412	2200	439
1	500	Whse.	CW	550	350
1	300	G.E.	MTP-561	2200	1800
1	200	G.E.	IM 440/2200		580
1	125	G.E. unused	MT-557	220/440	1200
1	100	G.E.	MT-564	440/2200	450
1	250	G.E.	IM-16	220/440	875
1	250	A.C.	ANY	550	600
1	250	Whse.	CW	2200	450
1	250	Cr.Wh.	Size 29Q	2300	350
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	IE-13B	220	1800
2	200	Whse.	CW-880	2300	1775
1	200	Cr.Wh.	SR-26QB	440	505
2	200	G.E.	IM-17A	2200	435
3	100	A.C.		440	695

SQUIRREL CAGE

2	100	Whse.	B.B.CS-607	220/440	1780
1	800	G.E.	KT-573	2200	1180
1	500	G.E.	FT-559 AY	2200	3600
2	500	Whse.	CS-1115	3300	863/445
4	500	Whse.	CS-1216	2200	500
2	450	Ell.	F-3910	2200	1200
1	400	Whse.	CS-7151-610H	6600/4000	3585
1	300	Whse.	CS-1002	2300/440	600
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2	1750	G.E.	ATI	2300	3600
1	1750	G.E.	TS	2300/4600	900
1	700	G.E.	TS.8P.F.	2200	1200
1	350	Whse.	1.0P.F.	440	900
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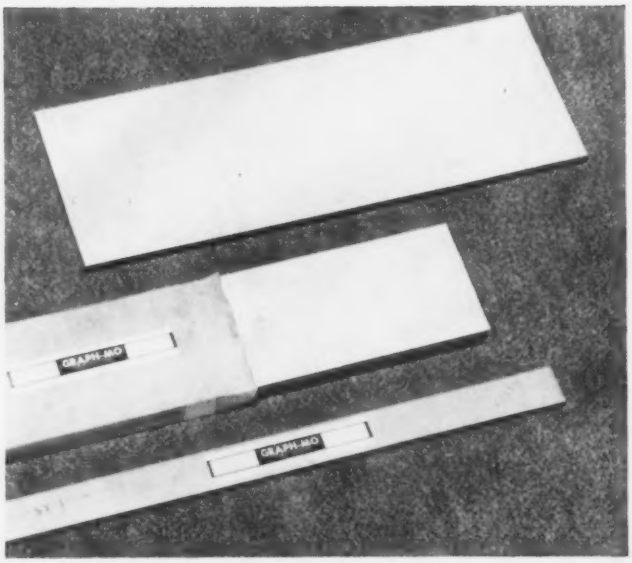

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